

Chapter 26

Energy Medicine and Matrix Regeneration

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ABSTRACT

Energy medicine includes a variety of diagnostic and therapeutic tools that are becoming increasingly popular worldwide and that are steadily entering mainstream medicine. Matrix Regeneration is an approach that is emerging from our increasing understandings of how various forms of energy are used by the human body to regulate living processes such as healing. For example, an injury results in an electrical wave called the injury potential that triggers healing and regeneration; a number of modern therapeutic devices introduce comparable electric waves that stimulate natural tissue repair processes. It has also been discovered that injured cells emit light that is sensed by other cells and that light triggers both cell division and cell migration to an injury site. These biophysical phenomena also help explain how various hands-on and device-based therapies stimulate healing.

The "living matrix" is the largest organ system in the human body. It consists of the extracellular matrix, i.e. the connective tissues and myofascial systems, and their extensions into the cytoskeleton and nuclear matrix of every cell. The matrix forms a continuous semiconducting network reaching into every nook and cranny of the body. Neurons, skin, the intestinal lining, capillary walls, arteries, immune cells, and even DNA are all components of this matrix. As a whole-body substrate for chemical, electronic, and mechanical signaling, as well as access to genetic information, the quality and integrity of the living matrix is a major factor in maintaining optimal health, vitality and longevity. This article summarizes the scientific basis for a variety of technologies that enable the physician to interrogate the entire matrix and to detect and correct imbalances and thereby resolve health issues. Of particular interest is the application of the Vascular Autonomic Signal (VAS) to detect areas of the body that are physiologically stressed or that are in early stages of disease onset, when they are easier to correct.

Keywords: connective tissue, longevity, energy medicine, frequency, spontaneous healing, inflammation, living matrix, physiological balance, matrix

INTRODUCTION

Anti-aging medicine is becoming a major discipline in health care worldwide, as evidenced by the growing popularity and global spread of the A4M conferences. Energy medicine is also growing in popularity because it includes techniques that are often capable of resolving medical issues that are difficult to diagnose or treat by other means. The public is attracted to energy medicine because the techniques provide excellent healing in all stages of disease, from pre-symptomatic to chronic and intractable. Moreover, the treatments are very cost-effective, are generally non-invasive and have few if any lingering side effects. After a long period of skepticism, the science behind energetic approaches is emerging as a rich and fascinating topic with major implications for prevention and longevity.

As with anti-aging medicine, there are several major categories of practices in energy medicine. To be specific, energy medicine encompasses both hands-on or manipulative therapies (Table I) as well as an increasing number of therapeutic devices. Some approaches involve a combination of hands-on and therapeutic instruments. Basic biophysics and the living matrix concept are providing scientific understandings of the effectiveness of these approaches.

Table 1. Applications of Energy Medicine

Acupuncture	Alexander	Biodynamics	Body Talk
Bowen	Chiropractic	Consegrity	Cranial-sacral
Feldenkrais	Healing touch	Holographic Repatterning	Homeopathy
Massage	Osteopathy	Palates	Pranic Healing
Polarity therapy	Reiki	Rolfing/Structural Integration	Therapeutic touch
Yoga	Zero Balancing		

This essay focuses on therapeutic approaches that utilize biofeedback that informs both patient and practitioner. Such systems are instructive for the practitioner because they involve the integration of both branches of energy medicine: touch and technology. There is a basis for these devices in the Vascular Autonomic Signal (VAS), which is increasingly being utilized for diagnostic purposes. The VAS is a sensitive indicator of the condition of a variety of systems within the body. The article begins with a description of the VAS and continues with consideration of its application as part of diagnostic and treatment protocols.

THE VASCULAR AUTONOMIC SIGNAL



Figure 1. The radial artery pulse.

A discussion of the VAS begins with the work of French physician, Dr. Paul Nogier, who taught neurology at the medical school in Lyon, France. Nogier also studied Traditional Oriental Medicine, which includes sophisticated methods of analyzing the radial artery pulse (Figure 1). In 1966, Nogier discovered that the Vascular Autonomic Signal was evoked in the radial pulse (termed the RAC in French, for *Réflexe Auriculo-Cardiaque* or *Autonomic Circulatory Reaction*) when he touched certain points on the ear of a patient. Subsequently, he discovered that the arterial system responds in a reproducible manner to a variety of changes to key physiological systems in the body. To be specific, the VAS is a rapid change in the tone of the smooth muscles in the walls of the arterial system throughout the body, mediated by sympathetic and parasympathetic neurons.^{1,2}

Distinct changes in the amplitude and other characteristics of the pulse take place when certain points on the ear are stimulated. This occurs consistently and is both repeatable and measurable by modern equipment. The response that is felt by the practitioner is a qualitative variation in the perception of the pulse that begins from 1 to 3 cycles after the stimulus begins and continues for about 8 to 15 cardiac cycles.³ Nogier found that there are four pulse responses to stimuli: no response, the weakening of the pulse signal (negative V.A.S.), increase of the pulse signal (positive V.A.S.), and a sharp pulse spike. These responses occur from colors, magnetically induced currents, sound frequencies, light waves, emotions, touch, substances, and electromagnetic frequencies. There is considerable medical interest in the VAS, as evidenced by five International Symposia, the most recent one held in Lyon, France in 2006. Several United States Patents⁴ and several diagnostic and therapeutic tools are based on the phenomenon. The method is sometimes referred to as Peripheral Arterial Tonometry.

Although the term "signal" as in the "Vascular Autonomic Signal" is widely used, many who use the system consider the term "response" as more accurate. A response is an answer to a question, and the VAS is the body's reaction or answer to a question posed by the introduction of stimulation into the body or into its energy field. For a discussion of the term, "energy field," see Oschman.⁵

The VAS is extremely sensitive, and can be used to discover both the best treatment for a symptom as well as more subtle levels of disturbances in the organism. These can include blockages to the healing response, layers of pathology, the appropriate priority for treatment and even subclinical issues. The VAS can be used both before and after a treatment to determine the accuracy of the diagnosis and the success of the treatment. In essence, the VAS is a very sensitive way of "listening" to the body. A wide variety of therapeutic schools around the world train practitioners to read the VAS and use it to define areas of the body under stress, the causes of the stress, chemical intolerances and the degree of success of interventions. The VAS can also provide early warnings of subclinical issues and therefore provide the practitioner with the opportunity to reverse developing conditions at an early stage.⁶

DIAGNOSTIC APPLICATIONS OF THE VASCULAR AUTONOMIC SIGNAL

A number of devices based on the VAS are being incorporated into mainstream medical practice. They are generally non-invasive and are extremely sensitive for detecting the location of elusive pathologies or serious medical conditions that are in early stages of development. The implications of these techniques for anti-aging and longevity are obvious.

One system is based on Peripheral Arterial Tonometry, an autonomic response of the cardiovascular system that can provide an early warning of cardiovascular disease.⁷ This application of VAS is a device that is worn at home while sleeping. It diagnoses factors contributing to obstructive sleep apnea syndrome.

A second device, by Itmar, is used as an early warning for coronary artery endothelial dysfunction, before symptoms begin to manifest.⁸ This system uses continuous monitoring of the pulse in the fingertip with a preprogrammed calibration as determined by medical practitioners. It measures temporary changes in the cardiovascular pulse that occur naturally throughout the body when the autonomic nervous system is stressed.



Figure 2. The Ondamed[®] system, with components on the top, including the hand held applicator (front), the neck applicator and the frequency regulator.

A third technology (Figure 2) has very broad applications.⁹ It consists of a non-invasive system that detects cardiovascular responses to electromagnetic stimulation at various frequencies ranging from 0.1Hz to 32,000Hz. The device supplements a physician's decision-making process, and is used in conjunction with knowledge of a patient's history and other clinical findings. The device is a computerized programmable system that is used by a medical practitioner to deliver weak magnetic pulses of various frequencies to the body, during which time the practitioner detects temporary changes in the radial artery pulse or VAS. This pulse response indicates which frequencies stimulate the autonomic nervous system, leading to a VAS.

Many frequencies and ranges of frequencies have been correlated with particular conditions, tissues, organs, or areas of the body. The practitioner scans through the entire range of frequencies delivered by a neck applicator (see Figure 2) to determine the frequencies most important to a patient. The location of the tissue or area that is most responsive to a particular frequency can be

determined by moving the Hand-held Applicator (Figure 3) over areas of the body. One advantage of the system is that sometimes the VAS can be detected before a condition has begun to manifest symptoms. This is particularly important for conditions that may prove life threatening if not caught early.

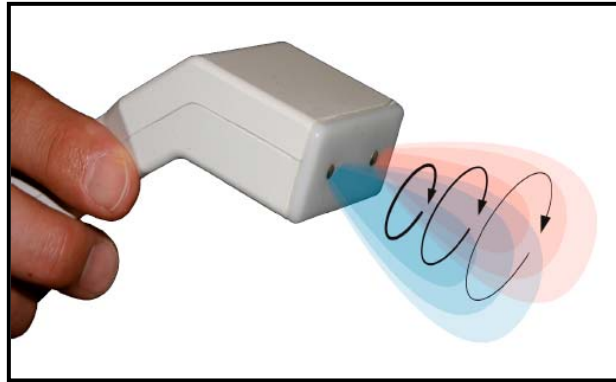


Figure 3. Hand-held Area Applicator.

The frequencies can, in principle, be applied at any point on the body. In practice, however, it is convenient to use two magnetic coils, wound in opposite spirals, in an applicator that rests loosely around the neck of a reclining patient. The system is designed in such a way that no current flows directly from the device to the patient. Instead, microcurrents are induced in the tissues of the body by a pulsing magnetic field delivered through the magnetic applicators that are encased in non-conducting plastic. There is therefore no transcutaneous flow of current and no risk of electrical shock. The magnetic fields used are comparable in strength to those naturally present in the body and in the environment due to the magnetic field of the earth. Hence there is no known risk of movement of metallic objects or implants in the body. The system has been used internationally for more than a decade without reports of adverse effects. There is considerable anecdotal evidence showing positive results, and the system has been used in small-scale trials and is in the early stages of clinical testing.

There are two primary mechanisms by which magnetic fields can introduce energy (microcurrents) within the body, whether for diagnostic or treatment purposes. The usual textbook explanation involves the laws of induction: a time-varying magnetic field will cause charges in surrounding regions to move. In living systems the primary charge carriers for low frequency electric currents are thought to be electrolytes: the charged ions such as sodium, potassium and chloride, which are abundant in blood and other body fluids. Another mechanism that becomes more important at higher frequencies involves much smaller charged particles such as electrons and protons (hydrogen ions) that can be semiconducted through the living matrix, to be described below. Semiconduction and magnetic effects arise in part because of the Hall Effect, an important physical phenomenon discovered in 1879 by Harvard Physicist Edwin H Hall.

Biophysical studies have shown that cells and tissues can respond to electrical signals that are far weaker than those needed to depolarize neurons, produce heating or cause ionization.¹⁰ Moreover, magnetic fields can cause dipolar molecules (molecules that do not have a net electrical charge but that have an uneven distribution of charges) to bend or rotate or change their configuration. In other words, enzymatic processes and cell behavior are both field-sensitive.¹¹

THE LIVING MATRIX

The living matrix is a continuous physical network reaching into every part of the body. While this “organ of form” has not attracted the same attention in biomedical research circles as other major systems, such as the nervous, circulatory, reproductive, digestive, immune, and other systems, the living matrix is actually the fundamental material that forms all of the systems, organs, tissues, and cells in the body. The living matrix concept evolved from the discovery that molecules called integrins traverse cell surfaces, joining the cytoskeleton of every cell with the extracellular or connective tissue

matrix.^{12,13} Deep inside every cell, the cytoskeleton also connects to the nuclear matrix and to the genome.¹⁴

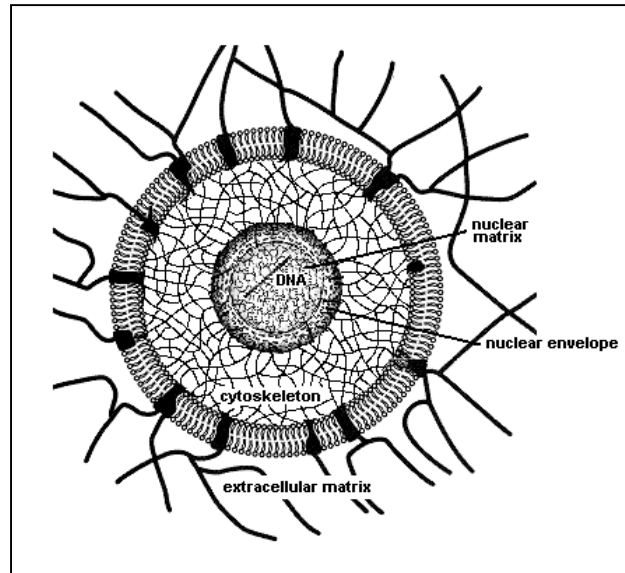


Figure 4. A cell and its surrounding matrix.

Figure 4 shows a cell and its surroundings. Note the nuclear matrix within the cytoplasmic matrix within the extracellular matrix. Molecular biologists have described the thousands of different molecules comprising this matrix system. A prominent scientist from Johns Hopkins University School of Medicine in Baltimore, Donald Coffee, and his colleague, KJ Pienta, wrote about this system:

*Cells and intracellular elements are capable of vibrating in a dynamic manner with complex harmonics, the frequency of which can now be measured and analyzed in a quantitative manner ...These vibrations can be altered by growth factors and the process of carcinogenesis ...a tissue matrix system consisting of the nuclear matrix, the cytoskeleton, and the extracellular matrix...is poised to couple the biological oscillations of the cell from the peripheral membrane to the DNA...*¹⁵

Fascinating research from Donald Ingber and his colleagues at Harvard Medical School shows that tensions in the matrix are as significant as chemical factors in regulating cellular activities.¹⁶ And the research summarized above indicates the significance of electrical and magnetic factors. Taken together, the matrix and its energetic properties provide a mechanism for the semiconduction of electrons and protons at various frequencies throughout the body.

One of the most prominent scientists to research electronic biology was Albert Szent-Györgyi, who received the Nobel Prize in 1937 for the synthesis of Vitamin C. He observed that living processes are too rapid and subtle to be explained only by slow moving chemical reactions and nerve impulses.¹⁷ To account for the speed and subtlety of living processes, he described in detail how the double bonds in the backbone of protein molecules contribute free or mobile or delocalized electrons that can move extremely rapidly throughout the body. He viewed the protein fabric as the "circuitry" that conducts mobile electrons and protons. His key contribution was the identification of proteins as semiconductors.¹⁸ Migration of electrons can take place within the matrix far faster than the random diffusion of chemicals and nerve conduction that is measured in meters per second. Signaling with electronic and electromagnetic signals can be virtually instantaneous.

Until recently, these ideas have had little experimental support and even less impact in the fields of physiology and biomedicine. This has changed, however, because the reality of the semiconducting nature of proteins and other components of the matrix is providing the basis for a

nanoelectronics industry, which is producing molecular and atomic circuitry.^{19, 20} In other words, an entire global industry is turning to biology for inspiration in miniaturization of electronic devices.

ENERGY MEDICINE IN THERAPEUTICS

The above descriptions of the VAS and the living matrix lead to a consideration of how oscillating fields can be introduced into the body for diagnostic and therapeutic purposes. Once the critical frequencies have been identified with the VAS, various signals can be introduced for therapeutic purposes. For example, shortly after his discovery of the VAS, Nogier described a set of frequencies and their harmonics that could be used constantly in routine medical practice, as they are preferentially recognized by the body. They enter into resonance with specific tissues and exert specific effects. Thus, frequencies can be varied for diagnosis or selected for treatment.²¹

The Ondamed[®] system described above (Figures 2 and 3) has applicators of various shapes and sizes that allow the magnetic pulses to be delivered to particular areas, e.g., the neck, the abdomen, a joint, the spine, an organ, a gland, or a muscle.

The use of a range of frequencies of electromagnetic pulses to provide therapeutic stimulation is well known. The first devices to be approved by the Food and Drug Administration for this purpose were developed in the early 1980's by Brighton, Bassett and others, who demonstrated that fracture 'non-unions' could be stimulated to heal using tiny electric and magnetic fields. A review of this widely used technology was published by Bassett in 1995.²² The methods were so successful that they were tested on other tissues. It was found that each tissue responds to a different frequency.²³ Currently a variety of pulsed electromagnetic field and implantable electrical stimulators are available to stimulate the repair of delayed union of fracture (improper healing within 6 months) or fracture nonunion (failure of union after 6 months). There are now hundreds of devices for electromagnetic stimulation at various frequencies for nerve and muscle, pain relief, incontinence, evoked responses, bone and wound healing, and reduction of stress. Some of these are biofeedback systems.

CONCLUDING REMARKS

Optimum health, vitality and longevity depend on maintaining the structural and functional integrity of our internal energetic systems. Technologies employing the Vascular Autonomic Signal (VAS) can be used to diagnose subtle levels of disturbances in the organism and determine the best treatment. This diagnosis can include blockages to the healing response, layers of pathology, the appropriate priority for treatment, and even subclinical issues. In essence, the VAS is a very sensitive way of "listening" to the body. A wide variety of therapeutic schools around the world train practitioners to read the VAS and use it to define areas of the body under stress, the causes of the stress, chemical intolerances and the most beneficial interventions. The VAS can also provide early warnings of subclinical issues and therefore provide the practitioner with the ability to reverse developing pathologies.

REFERENCES

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³ <http://www.sedatelec.com/english/acupauri.htm>

⁴ United States Patent 6,942,622, issued September 13, 2005, for Method for monitoring autonomic tone.

⁵ Oschman JL. Energy Medicine: the scientific basis. Edinburgh; Churchill Livingstone/Harcourt Brace: 2000.

⁶ Agnes M. Toward an Integral Energy Medicine Model for Understanding the Vascular Autonomic Signal. Ph.D. Thesis, Greenwich University - Holos University: 2002.

⁷ Bonetti PO, Pumper GM, Higano ST, Holmes DR, JR, Kuvin JT, Lerman A. Noninvasive Identification of Patients With Early Coronary Atherosclerosis by Assessment of Digital Reactive Hyperemia. *Journal of the American College of Cardiology* 44(11): 2137–21 41: 2004

⁸ Bonetti PO Pumper GM Higano ST Holmes DR Kuvin JT Lerman A. Noninvasive identification of patients with early coronary atherosclerosis by assessment of digital reactive hyperemia. *J Am Coll Cardiol.* 44(11):2137-41: 2004.

⁹ <http://www.ondamed.net/>

¹⁰ Adey WR. A growing scientific consensus on the cell and molecular biology mediating interactions with environmental electromagnetic fields. In: Ueno S (ed) *Biological effects of magnetic and electromagnetic fields*. Plenum Press, New York Ch. 4, pp. 45-62: 1996.

¹¹ Westerhoff HV Kamp F Tsong TY Astumian RD. In Blank M Findl E (eds) *Mechanistic approaches to interactions of electric and electromagnetic fields with living systems*. Plenum Press, New York, pp. 203-215: 1987.

¹² Bretscher M. C-Terminal region of the major erythrocyte sialoglycoprotein is on the cytoplasmic side of the membrane. *J Mol Biol.* 1975;98:831-833.

¹³ Horwitz AF. Integrins and health. Discovered only recently, these adhesive cell surface molecules have quickly revealed themselves to be critical to proper functioning of the body and to life itself. *Scientific American.* 1997;276:68-75.

⁸ Maniotis AJ, Chen CS, Ingber DE. Demonstration of mechanical connections between integrins, cytoskeletal filaments, and nucleoplasm that stabilize nuclear structure. *Proc Natl Acad Sci USA.* 1997;94:849-854.

¹⁵ Pienta KJ, Coffey DS. Cellular harmonic information transfer through a tissue tensegrity-matrix system. *Medical Hypotheses.* 1991;34:88-95.

¹⁶ Ingber DE. The riddle of morphogenesis: a question of solution chemistry or molecular cell engineering. *Cell* 1993;75:1249-1252.

¹⁷ Szent-Györgyi A. See: Oschman JL. *Energy Medicine: the scientific basis*. Edinburgh: Churchill Livingstone/Harcourt Brace; 2000.

¹⁸ Szent-Györgyi A. Towards a New Biochemistry? *Science* 93:609-11:1941.

¹⁹ Strosio MA, Dutta M. Integrated biological-semiconductor devices. *Proceedings of the IEEE.* 2005;93:1772-1783.

²⁰ Hush NS. An overview of the first half-century of molecular electronics. *Annals of the New York Academy of Sciences.* 2003;1006;1-20.

²¹ Nogier P Nogier R. *The man in the ear*. Maisonneuve, 255 p.: 1979.

²² Bassett CAL. Bioelectromagnetics in the service of medicine. In: Blank M (ed) *Electromagnetic fields: biological interactions and mechanisms*. *Advances in Chemistry Series 250*, American Chemical Society, Washington DC: pp. 261-275: 1995.

²³ Sisken BF Walker J. Therapeutic aspects of electromagnetic fields for soft-tissue healing. In: Blank M (ed) Electromagnetic fields: biological interactions and mechanisms. Advances in Chemistry Series 250, American Chemical Society, Washington DC, pp. 277-285: 1995.

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Dr. James L. Oschman is the President of Nature's Own Research Association, and is a leading authority on the science behind a wide variety of energy medicine therapies. He has a BS degree in biophysics and a Doctoral degree in biology from the University of Pittsburgh. He has worked in major research labs around the world, and his scientific papers have been published in the world's leading journals. Jim is also the author of *Energy Medicine: The Scientific Basis*, published by Churchill Livingstone. This book gives the most ardent skeptic a logical and scientifically sound basis for a variety of therapies. Elsevier Health Sciences published Jim's second book, *Energy Medicine in Therapeutics and Human Performance*. This research provides new insights into the ways the body can function in peak athletic or artistic performances and in profound therapeutic encounters. Jim's research has led to useful insights that can help all health care professionals better understand and advance their work and explain it to others. He has also become involved in the development of cutting-edge medical devices and other applications of the emerging concepts of energy medicine. Jim is a member of the Scientific Advisory Board for the National Foundation for Alternative Medicine, and is the recipient of their Founders Award. He has also received a Distinguished Service Award from the Rolf Institute. You can learn more about his work on his website: <http://www.energyresearch.us/>

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