



RESONANT SPECIFIC TECHNOLOGIES, INC.

WHITE PAPER: SANEXAS neoGEN-Series Device, and Electric Cell Signaling Treatment

An energy approach to healing has not been typical subject matter for the management of acute and chronic pain. This subject embraces molecular biology of the cell, biochemistry, bioelectricity, biophysics, quantum mechanics and the complex and integrated interactions; after all, chemistry and physics are merely artificial categories of study of these integrated smooth-running systems.

It is well known and well accepted that electricity plays an important role in contemporary medicine. Our largest organ, the skin, generates a voltage across itself everywhere on the body, yet the signaling function of this “skin battery” remains largely unexplored. In diagnostic applications there are a number of valuable devices such as electrocardiography, electroencephalography, electromyography, nerve conduction velocity, electrooculography, electroretinography, electrooculography, evoked potentials, skin galvanic/impedance tests, bioelectric field imaging (BFI), current perception threshold testing, and nerve conduction testing.

The historical development of therapeutic electrical modalities includes a number of medical devices: TENS, percutaneous electrical nerve stimulators, powered muscle stimulators, interferential current devices, spinal cord stimulators, electroconvulsive therapy, high voltage galvanic stimulators, transcranial electric stimulators, micro-current stimulators, bone growth stimulators, deep brain probe stimulators, electric cell signaling devices, and electronic signal intonation.

Learning how to apply sophisticated energy techniques for healing is a complex but rewarding undertaking. A goal of RST and Sanexas has been to increase the awareness and understanding in the medical community of the healing potential of electrical fields.

Electric Cell Signaling Treatment (EST) is far superior to TENS therapy, a claim which will be substantiated below; in fact, TENS is to EST, like X-ray is to an MRI. For a variety of reasons, not related to safety or efficacy, this “physics” approach to healing has been not well understood by the medical community. The facts and theories of

electrical medicine are, however, as well grounded in science as are more recent advances in medicine, such as, pharmacological, genetic, or procedural in nature.

The RST-Sanexas neoGEN-Series system produces complex electric signal energy waves along with associated harmonic resonance frequencies which, will imitate, facilitate, exhaust or interrupt the neuron's axonal action potential. RST-Sanexas electric signal energy is administered by an ultra-high digital frequency generating system (UHdfg). The complex signal energy waves are formed as electrically balanced, biphasic symmetrical primary energy waveforms, and then modulated by superimposed therapeutic frequencies with associated harmonic resonance. The dosage to the patient is continually varied to create rapidly changing energy signals that can easily pass through dermal tissue and avoid nerve accommodation caused by repetitive and predictable waveform signaling.

Simultaneous modulation of both the signal frequency and the varying amplitude of the delivered electric signal energy ensure no neuronal accommodation; this feature distinguishes the RST-Sanexas neoGEN system from virtually all other electromedical devices worldwide. Continuous changes in these values are applied at specific incremental quarter-tone steps, which are mathematically calculated to produce harmonic resonance and vibratory effects on the membrane of the cells, important for reestablishing natural organized chaos in the biosystem. This newer technology has been referred to as *Electronic Signal Intonation (ESI)* and provides a distinct proportional mixture of stimulation (St) signals and multi-facilitation (Mf) signals from both amplitude, modulated (AM) and frequency modulated (FM) energy sources for differentiated electric cell signaling needed for optimal effectiveness in healing.

These time-varying pulsed electric energy signals, associated harmonics, and resonance frequencies are typically introduced through the skin of injured or diseased tissue by special vasopneumatic electrodes to produce numerous physiologic advantages over older electromedical electrode designs.

Numerous kinds of electrical currents with varied parameters are offered today in electromedicine. The diversity of electromedical signal currents is the result of the infinite possibilities to vary the intensity and even the direction of the current in time. These electric signal variations can create different physiological and therapeutic effects for the patient treatment. Typical terminology to describe or define these different types of therapeutic electrical currents is usually according to their primary frequencies: low, middle and high frequency currents. This classification system can be traced back through hundreds of articles and clinical reports in the literature and includes many scientific investigators.

Low frequency currents and/or modulated middle frequency currents to a low frequency rate can be efficaciously used for imitative or exhaustive stimulation of excitable tissues (receptors, nerves, and muscles).

The special characteristics of middle frequency currents also include the frequency-dependent *decrease* of the capacitive resistance and the *decrease* of local

discomfort and systemic electro-toxicity. Additionally, middle frequency signal currents have a special threshold behavior with a typical diminishment of current sensation correlated to *transient excitatory activity* in surrounding tissue. Increasing the amplitude of the signal will increase the treatment coverage area as well as produce the generation of a reversible, partial sustained depolarization in nerves with a true neuron block and in muscles with a physiological *contracture*.

Almost all technologically-advanced electromedical devices capable of delivering middle frequency (Multi-facilitation) currents, operate *only* from an amplitude modulated (AM) electro-technical format. The RST-Sanexas neoGEN-Series electric cell signaling system utilizes amplitude modulated (AM) signaling, frequency modulated (FM) signaling and a patented “frequency-hopping-spread-spectrum” (FHSS) signal generation energy delivery format for all low frequency (St) and middle frequency (Mf) signals and their respective physiological effects. The system changes automatically and delivers simultaneously AM and/or FM electric cell signal energy to imitate, facilitate, exhaust and/or interrupt the axon action impulse mechanism without possibility of neural accommodation. Periodic dwell times on specific frequencies (that have been mathematically calculated) are sequentially, yet randomly, actuated to produce harmonic resonant vibratory effects to the (nerve) cell membrane, voltage-gated ion channels and surrounding tissue according to Schumann Resonance Theory and Fibonacci Scale research work. These harmonic frequencies enable the cell to take up energy during the dwell time which is then utilized for cell repair and healing.

Much of the description and explanation of the electric signaling introduced above is still beyond the understanding of the average physician, mid-level health care provider, third party payer, etc. To the untrained, this technology can often appear to be of relatively limited difference as compared to standard TENS treatment, both in application and immediate patient experience. Comparison of an X-ray to an MRI is dramatic both in appearance of the equipment and patient experience.

Therefore, the bottom line proof in efficacy of EST, ESI and CET is dependent on actual patient outcomes, much of which can be subjective. Numerous citations in the literature support the superior efficacy of this technology in a wide variety of pain states. Patients have reported improvements in peripheral neuropathy, all forms of spine pain, joint pain, CRPS, and acute sports and minor injuries of daily living. This technology has a positive, reproducible impact on wound healing by increasing blood and lymph circulation. It will be a valuable adjunct to wound care clinics worldwide.

More importantly, recent objectively measured outcomes have been recorded in the treatment of peripheral neuropathy: 1) regeneration of nerves using epidermal nerve fiber density (ENFD) biopsies; and 2) improvement in A-delta NCS (small nerve fiber) neurodiagnostic testing. These clinical findings and pronounced physiological effects have elicited substantial healthcare industry attention and is incurring more widespread acceptance of the technology by third party payers.

Electric cell signaling treatment involves physical science and not chemistry. Therefore, it is considerably more natural and physiological to the human body. This technology is extremely safe, non-invasive, effective and virtually free of undesired side effects. It can also be utilized in conjunction with other energy modalities; including advanced electronic devices currently under development at RST.

“We envision future directions of research and clinical use to include the synergistic and cost saving incorporation of electric cell signaling technology with recent developments in quantum physics as they pertain to bio-logic oscillations, neural networks and cellular microtubule functions in energy transfer, proton motive force, and cellular capacitance”.

References / Published Papers:

1. **CET for Peripheral Neuropathy Treatment**; Practical Pain Management; October 2015
2. **Mitigating Phantom-Limb pain with Electrical Cell Signaling**; Practical Pain Management; May 2015
3. **Effectively treating CIPN**; ASCO University; 2015
4. **Quantum Theory treats Neuropathy better than Pharmacology**; AAPM Annual Conference; Winer 2014
5. **Peripheral Neuropathy Treatment Taps into Quantum Theory**; AAPM/Medscape; September 2014
6. **Can CET have an impact on DPN**; Podiatry Today; July 2014
7. **Quantum Theory Underpins Electromagnetic Therapies for Pain Management**; Practical Pain Management; January/February 2013
8. **EST and Local Anesthetic Successfully Treats Pain Associated with DPN**; Practical Pain Management; April 2012
9. **New Technique Combines EST and Local Anesthetic for Pain Management**; Practical Pain Management; June 2011
10. **Anti-Inflammatory Effects of EST**; Pain Physician; November/December 2008
11. **Electric Analgesic Nerve Block**; Practical Pain Management; April 2006
12. **EST treatment and Resolution of DPN, Arterial Ischemia, Stenosis and Progressive Gangrene**; AAPM Annual Conference; 1992
13. **EST for Ovarian Cyst Resolution**; Advances in Therapy; 1991