

The Balance Machine has been devised as a specialized tool in bio-information to assist healthcare practitioners in providing wellness programs for their patients and clients. Using the principles of biology, quantum physics, and the science of information, it facilitates a meaningful communication between computers and the human body that is an evolution of biofeedback. It is a sequence of elegance -- the computer poses the question, the body answers, and not a word is spoken – giving healthcare practitioners a better tool to bring wellness to their patients.

Science & Technology

Your body is an amazing biochemical orchestra. The human body is working in glorious harmony 24 hours a day 7 days a week. In an orchestra all of the instruments play a melody together performing each and every note, seamlessly creating beautiful music. The human body works in exactly the same way. Each part of your physiology has a role and function and the body's intelligence creates a perfect physical harmony within you. Your autonomic nervous system never sleeps and always works to keep your body functioning in perfect balance called homeostasis.

The autonomic nervous system conveys sensory impulses from the blood vessels, the heart and all of the organs in the chest, abdomen and pelvis through nerves to other parts of the brain. These impulses often do not reach our consciousness, but elicit largely automatic or reflex responses through the efferent autonomic nerves, thereby eliciting appropriate reactions of the heart, the vascular system, and all the organs of the body to variations in environmental temperature, posture, food intake, stressful experiences and other changes to which all individuals are exposed.

It is evident; therefore, that while we are not constantly aware of the activity of the autonomic nervous system as we are of unusual sensory and motor events, the normal functioning of the autonomic nervous system day and night, from heart-beat to heart-beat, plays a largely unconscious but vital role in our livelihood.

In an orchestra, the musicians are keenly aware when someone plays a wrong note even if the audience didn't hear it. The trained musician knows exactly what each musical piece should sound like; the notes, the tempo and the feel of the music. And when one thing isn't correct the trained musician quickly notices the problem and tries to correct the mistake. Your body works this same way.

Your cells communicate constantly with each other about the functioning of your physiological systems. When one thing is just a little off, the human body attempts to correct the problem and regain homeostasis.

Each cell in your body communicates with every other cell in its own language of electrochemical reactions. In a research article done in 2003 called "Cell Communication and Signaling" Dr. Bernard Perbal states,

"All forms of communication between human beings have long been recognized as a requirement for reciprocal understanding, transfer of knowledge and productive development of societies. This also applies to living cells that are organized in "micro societies" that constantly adjust to their environment through a complex network of signaling pathways. The chemical communication which occurs at various levels results in an integrated exchange of information that is essential for coordinated responses.

Birth, life and death involve the integration of a complex array of biosignals that living cells sense and process to respond and adapt to modifications of their environment.

The signals that are sent and received by cells during their whole existence are essential for the harmonious development of tissues, organs and bodies. They also govern movement, thought and behavior.

It is now well established that cells do not behave as selfish entities but rather tend to form "micro societies" whose proper functioning requires a precise coordination of emission and reception of signals. Dysfunctioning of the communication networks is associated with pathological situations that can range from abnormal proliferation to death.

Deciphering the molecular basis for the coordinated treatment of biological signals is a challenge of prime importance. It will provide better insight into the processes governing fundamental biological activities such as growth, differentiation, and quiescence. It will also open the road to new therapies in order to fight diseases resulting from improper signaling.

Hormones, growth factors, neurotransmitters are among the signaling agents that have been the most extensively studied. In each case, individual cell reactions are transmitted via inter cellular signals to neighboring cells and integrated to generate a global cellular response at the level of tissues, organ and body. The ability to communicate between cells is an absolute requisite to ensure appropriate coordination of the cell activity at the level of organisms. The endocrine hormonal signaling processes have provided several examples of complex relationship among regulatory pathways. Many receptors have been identified and shown to play critical roles in the adaptive cell response.

Numerous studies have permitted to decipher the various steps of signal transduction, i.e. the propagation of chemical signals, from the outside of the cell to the nucleus and establish their critical function in the maintenance of normal cell behavior. Because of their key role in the control of normal life, and because alterations of the signal transduction pathways have been associated to the development of many types of pathologies including cancer, these processes have been the subject of thousands of publications.

Much less is known about the molecular basis for cell-cell communication which is taking place at the level of each organ and in whole bodies." (1)

What we know is that the cells of your body have their own language much like Morse Code. Morse Code is a series of dots and dashes that make no sense to the common person. You must have a trained ear to understand the message being sent and to correctly interpret its meaning.

In January 2005 an article was published called "A Morse Code for Human Cells." In this article Matt Goode of the BBSRC Media Office states,

"Morse code is a simple, effective and clear method of communication and now scientists believe that cells in our body may also be using patterns of signals to switch genes on and off... The number of 'dots and dashes' being used by each signal could have different purposes...

The researchers, funded by the Biotechnology and Biological Sciences Research Council (BBSRC) and working at the Universities of Liverpool and Manchester and the Royal Liverpool Children's Hospital, in collaboration with scientists at AstraZeneca and Pfizer, have studied transcription factors, the signaling molecules inside cells that activate or deactivate genes. They found that the strength of the signal is less important than the dynamic frequency pattern that is used.

Professor Michael White of the Centre for Cell Imaging at Liverpool and leader of the research group said, "The timing of the repeating signal is essential for its interpretation. It seems that cells may read the oscillations in level of transcription factors in a similar way to Morse code." (2)

This technology takes advantage of the body's cellular communication mechanisms, sending and receiving messages, questions and answers at a subconscious level.

Much like a stethoscope can focus on the sounds of your lungs and heart or a blood pressure cuff can pick up the pulsing in your veins, This Bio-Communication technology can survey the signals your body sends as a response to our queries sent to your cells. These tools provide information which the consumer can use when selecting which nutritional supplements to buy.

The Bio-Communication technology uses Galvanic Skin Response (GSR) as an interface between the human body and the computer. Computers work based on a very simple system of ones and zeros. According to the Biotechnology and Biological Sciences Research Council (BBSRC), your body's cellular communication is based on a simple system of on and off switches. GSR is a valid way to monitor the body's response.

"Galvanic Skin Response technology reads the minute changes in the hand in direct response to changes in the body called a "Biosignal." Biosignal is a summarizing term for all kinds of signals that can be continually measured and monitored from biological beings. The term biosignal is often used to mean bio-electrical signal. Electrical biosignals are understood to be changes in the electrical currents produced by the sum of electrical potential differences across a specialized tissue, organ or cell system like the nervous system. The best known technology to read these bioelectrical signals are equipment like

Electroencephalogram (EEG), Magneto encephalogram (MEG), Galvanic Skin Response (GSR) Electrocardiogram (ECG) and the Electromyogram (EMG) (3)

According to the University of Kuopio and the Biosignal Analysis and Medical Imaging Group (BAMIG).

“The galvanic skin response (GSR) can be used for capturing the autonomic nerve response... Due to the relative simplicity of measurement and a quite good repeatability GSR can be considered to be useful and simple method for examining autonomic nervous system function, specifically the peripheral sympathetic system.

In history GSR is also known as, or closely related to, the sympathetic skin response (SSR) and skin conductance response (SCR). In clinical neurophysiological literature, the response is known also as the peripheral autonomic surface potential (PASP). Most of the GSR studies in last decades are concerned with the normal values of response amplitude and latency. Also the habituation of response amplitudes during repeated stimulations have been studied....

It is possible that in the future this kind of GSR based methods may offer a new and potential tool for screening risk groups and populations in evaluating drug effects by revealing also the early and subtle alternations.”(4)

It is through the use of this amazing Bio-Communication technology, the body's response to a number of virtual stressors (stimuli) can be tested and these responses can be translated into a Stress Profile. The technology then queries the body with possible balancing herbal formulas and measures the response.

This data is then used to facilitate informed decisions on nutritional protocols. Using this data improves quality of life for people through herbal/nutritional supplementation.

References:

1. *Communication is the Key*, by Bernard Perbal, Laboratoire d'Oncologie Virale et Moleculaire, Universite Paris 7-0. Oiderot, 75005 Paris-France from *Cell Communication and Signaling* 2003, 1:3 doi: 10.1186/1478-811X-1-3 The electronic version of this article is the complete one and can be found online at: <http://www.biosignaling.com/content/1/1/3>
2. *A Morse Code for Human Cells*, by Matt Goode, BBSRC Media Office in association with the University of Liverpool, http://www.bbsrc.ac.uk/media/pressreleases/05_01_10_ce/Lmorse_code.html
3. *Biosignal* by Wikipedia <http://en.wikipedia.org/wiki/Biosignal>
4. *Galvanic Skin Response (GSR)*, by the University of Kuopio and Biosignal Analysis and Medical Imaging Group. <http://bsamig.uku.fi/index.shtml>
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