Jovanovic-Ignjatic and Rakovic (1999, p 8): Microwave Resonance Therapy (MRT) "... is a novel medical treatment developed in the former USSR, which represents a synthesis of the ancient Chinese traditional knowledge in medicine (acupuncture) and recent breakthroughs in biophysics. Affecting the appropriate acupuncture points by a generator of high frequency microwaves (52-78 GHz), remarkable clinical results of the treatment were demonstrated in surgery, orthopedics and traumatology, cardiovascular disorders, urology, gynecology, dermatology, gastroenterology, pulmology, upper respiratory tract, cardiology, neurology, and oncology during the last decade - the MRT being contraindicated only in the cases of acute pain in abdomen demanding an operation, pregnancy, and menstruation cycle. The high effectiveness of the MRT has also been confirmed in our practice, ...revealing significant improvement in 81.5%, moderate improvement in 15.1%, and insignificant changes in only 3.4% cases.

Jovanovic-Ignjatic and Rakovic (1999, p 1-2): "The yin-yang concept of acupuncture, as a network of energy-information processes of an organism, originating from embryological development, represents one of the most specific and most useful segments of the renowned Chinese traditional medicine...Indian traditional medicine, and especially one of its most prominent representatives, swara yoga, is also acquainted with an energy system analogous to the Chinese acupuncture system; in Indian terminology the qi is known as prana, and meridians as nadis (14 of them being basic, like in acupuncture, although three of them are of special medical and spiritual significance [this appears similar to the basis of REB$^{sm}$ which uses triple warmer, spleen and central/governing meridians as Radiant Circuits]."

"Besides its practical medical aspects, Chinese traditional medicine is deeply colored with mystical
connotations, which is one of the reasons why Western science has been reluctant to accept experiences of Eastern tradition. Another reason is that within the 12 visceral organs corresponding to the 12 paired meridians, Chinese tradition has not included the brain and endocrine glands: however, in the past few decades it was found that the acupuncture system was in close functional interaction with both the central nervous system and endocrine system, as well as with peripheral and autonomic nervous systems. The final reason was the lack of a clear anatomical basis of the Chinese acupuncture system; however, some investigations of gap junctions (specific intercellular channels...) have shown their increased concentration inside the acupuncture and meridians for an order of magnitude and their role in the epithelial conception of genesis of the system of vital meridians and their acupuncture points."

"It is well known that cell membranes have an extremely significant role in communications between cells. The evolutionarily older type of intercellular communication is achieved through gap junctions, transporting small metabolites and secondary messengers between inexcitable cells, and also transporting small ions between excitable cells (of the cardiac muscle, smooth muscle, epithelial liver cells, neurons with electrical synapses, and acupuncture points and meridians). The evolutionarily younger type of intercellular communication is mediated by electrochemical transmitters, through neurons separated by a cleft. Whether anions and cations equally flow through gap junctions has not been experimentally established to date, although empirical evidence of Swara yoga, combined with the evidence of the physiological influence of ions in air, suggest that anions dominantly flow through the left circulatory part of the acupuncture system, while cations dominantly flow through its right circulatory part... [In g]ap junctions... the normal intercellular separation of 20 nm is lowered to 3.5 nm at the gap junction of excitable cells, which enables direct transmission of electrical signals by ionic currents flowing through such channels (electrical synapses). All gap junctions consist of a pair of cylinders (connexons), one in the presynaptic and the other in the postsynaptic cell. The cylinders meet in the gap between the two membranes and contact, by means of homophilic (cell specific) interactions, to establish a communicating channel (~1.5 nm in diameter) between the cytoplasm of the two cells. Each cylindrical connexon (7~ .5 nm in length) is made of six identical protein subunits (connexins) - which have a function to self assemble connexon hemi-channels and to recognize the counterpart hemi-channel and complete a conductive channel. The whole such process is very flexible and depends on the electrochemical potential of the cell; the very conductivity of the gap junction can be modulated by intracellular pH-factor, Ca(2+)-ions, neurotransmitters and second messengers, and even by voltage -which can change the conformational state of the connexon (like the shutter in a camera)."

"A better organization of cell structures and an ionic basis of the qi entity of the acupuncture system is also suggested by an order of magnitude higher skin electrical conductivity of the acupuncture points in respect to the surrounding tissue, as well as much higher reabsorption of the air ions in these points - implying higher concentration of ions and gap junctions in the acupuncture points and meridians, too."

Jovanovic-Ignjatic and Rakovic (1999, p 4): "[The] quantum-like coherent characteristics of MRT [Microwave Resonance Therapy] inspired Sit'tko and coworkers to propose a quantum physics of the alive [organisms] ..., based on nonequilibrium thermodynamics and nonlinear electrodynamics of novel dynamically stable spatio-temporal biological structures as macroscopic quantum systems with nonlocal self consistent macroscopic quantum potentials, which can give rise to nonlinear coherent EM MW [ElectroMagnetic MicroWave] long-range maser-like excitations of a biological nonlinear absorption medium with the cells as active centers. In the framework of this model, acupuncture meridians might be related to eigen frequencies and spatio-temporal eigen waves distributions of every biological quantum system, being its individual characteristics."
"The above quantum picture can be more simply visualized ... by considering the acupuncture system as a dynamic structure assembled at the locations of the maxima of the quantum interference three-dimensional (3D) standing waves resulting from reflections from the skin of the nonlinear coherent EM MW [ElectroMagnetic MicroWave] Fröhlich excitations... of strongly polarized molecular subunits in the cell membranes and cytoplasmatic proteins. This is supported also by other investigations which suggest that formation of gap junctions (of higher density at acupuncture points and meridians...), which involves a gating process as well as the assembly of connexon hemichannels (or even connexon monomers) which reside in the membrane prior to joining with a counterpart in an opposite cell..., might be stimulated at spatio-temporal maxima of the MW EM field of the organism (similarly to voltage-sensitive conductivity of gap-junctions...)."

"In that context the explanation for the efficacy of the MRT as a noninvasive biophysical medical treatment should be sought...: some disorders in the organism (related to local changes of dielectric properties of tissues and organs) give rise to deformation in the standing wave structure of the MW EM field of the organism, which influences corresponding changes in the spatio-temporal structure of the acupuncture system, and consequently in the resonance frequencies of its meridians, resulting in some disease. During the therapy, applying the MW source at a corresponding acupuncture point the excited meridian of the patient's acupuncture system relaxes to the previous healthy condition while reaching its normal resonance frequency responses upon the wide spectrum MW source -- and following physiological mechanisms of acupuncture regulation (via nervous and endocrine systems...), the organism biochemically overcomes the disease."

"The afore-mentioned resonance frequency changes can be monitored indirectly by searching for the MW resonance frequency of the meridian before and during the MRT treatment, using coherent MW generators with manually changeable frequency...: it should be noted that sensory response to (gradually changing) resonance frequency decreases during recovery, practically vanishing when regaining the normal healthy condition. This suggests that the healthy condition might be considered as an absolute minimum (ground state) of Sit'ko's nonlocal self consistent macroscopic quantum potential of the organism, with some disorders of an acupuncture system corresponding to higher minima of the (spatio-temporally changeable) potential hypersurface in energy-configuration space, which possibly explains the higher sensory responses of the more excited (more disordered) acupuncture system and the poor MRT sensory response of the healthy acupuncture system already in the ground state..."

REFERENCES