

Resonance Signaling and Yoga

Introduction

Resonance phenomena abound in nature; this phenomenon is observed in human biology also. Resonance in natural structures is studied extensively; we have seen videos of bridges collapsing due to resonance induced by troop marching on the bridge or through natural phenomena. When the natural frequency of the bridge coincides with the natural or human-induced vibrations, the bridge oscillates at high amplitude, and ultimately, the structural integrity is lost and the bridge collapses. However, all resonance phenomena need not be of deleterious nature. Before taking up resonance signaling, let us briefly review the role of electromagnetics in biological regulation.

It is known for over a century that biologically generated (endogenous) electrical fields are produced around an injury, say on the skin. An electrical potential is created that initiates injury repair; reversing the polarity of the injury potential or eliminating it would dampen or abolish repair. This injury potential can also be generated in an instrument and could be used for injury repair or even for regenerating a lost limb in higher animals.^[1,2] This is being called information or regenerative medicine^[3] and though in its infancy seems to be a precise method to target specific reactions in the biological milieu. Regenerative medicine includes tissue engineering, cellular therapies, use of electromagnetic devices, and artificial organs.

Resonance signaling is a method of using specific frequencies to modulate cellular function for achieving homeostasis.^[3] Endogenous electromagnetic (EM) fields seem to be involved in cell regulation. Zhadin and Fesenko in 1990s discovered that ultra-weak magnetic and electric fields at very low frequencies could produce resonance effects.^[4] Similar ideas related to ion cyclotron resonance have been discussed by Dr. Liboff and others. These reports observe that specific frequencies to cell cultures could preferentially pump, say calcium ions into the cell. Other frequencies could be applied for various ion species so that ionic balance could be maintained or reestablished in cells. Each frequency is very specific for the ion species in question; hence, this method becomes highly selective in enriching and enhancing ion activity in cells. This method is also referred to as resonance signaling; a signal input that provides resonance interaction to a particular ion species could change the molecular milieu within a cell.

Much earlier to these developments, George Lakhovsky, a Russian-French scientist working with electromagnetic fields, fabricated a “multiple wave oscillator” which produced a wide range of EM frequencies. It was claimed that persons exposed to these low intensity fields had reduced pain and recovery from a host of diseases. It

is claimed that “When cells are irradiated with a correct polarized electromagnetic field (which has a broad range of frequencies), each cell will pick up on a frequency and assimilate the energy out of that field. This has a tremendous stimulating and harmonizing action on cells and thus interacts with surrounding tissues and organs.”^[5] These claims were not put to rigorous test in laboratories, and hence, the work of Lakhovsky was relegated as unscientific and was soon forgotten. Here, then, is a classical example of history repeating itself, though in more sophisticated forms with very specific functions.

Some powerful techniques have emerged in the area to study the effect of vibrational inputs to cells. At present, an instrument is used to track nanovibrations of cells. In this instrument, known as atomic force microscopy, mechanosensitivity of individual cells is observed wherein the cells seem to have specific vibratory signature for health. This field is termed “sonocytology.”^[6] It is not clear at this time if these vibrations are a part of endogenous cellular communications or have origin in the electromagnetic environment. However, it is clear from the work reported so far that vibrational signatures are of importance in tracking health of cells *in vivo*. “Such sounds might communicate the informational memory of the biofield and be used to enhance regulation of a variety of processes including differentiation, stem cell reprogramming, and the maintenance and manipulation of homeostasis” [6, p. 41].

Yoga’s Role in Resonance Signaling

Is there a connection between resonance signaling and yoga? There seems to be a dubious connection at best. Let us look at this in more detail. Most tissues in the body are piezoelectric; this means tissues could convert an electrical signal to a vibratory signal and vice versa.

It is known that bone and some tissues are piezoelectric in nature. It is also reported that even phospholipids, which form cell membranes, exhibit piezoelectric characteristics.^[7] This means that the membranes of cells as they undergo compression and decompression could generate electrical signals and may even open and close molecular “gates” in the cell membrane for movement of specific molecules in and out of cells. This could be achieved through specific voiced sounds that produce explicit electrical signals around the cells.

When we intone any sound, it has an auditory component, and at the same time, it creates an electromagnetic signal in proportion to the voiced signal – both with respect to frequency and intensity. A vibratory input such as a voiced mystical chant or mantra (not simply mentally, which could have other effects in the mind-subtle body complex) could

set cranial system into mechanical vibrations and these in their turn produce an electromagnetic signal inside the cranium. This signal could spread in the brain, and its outflow could propagate through the nervous system, bones, and other tissue. Thus, chanting – in fact any speech – could have a profound effect on the brain-body complex.

Conclusion

Chanting has been a recommended practice in most spiritual traditions of the world. It is likely that these chants are developed to cater to the mind-body health of individuals as well as for reaching higher states of consciousness. Yoga research has shown that genetic expression and release of specific hormones (including anandamide) are possible through the practice of the eight limbs of yoga as enunciated by Sage Patanjali.^[8] It is said by Swami Vivekananda that the subtle is the cause and we see the effect in the gross body. If psycho-somato-spiritual health is through sound, then what better way for keeping all these three healthy than following the ancient science of nada, sound?

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References

1. Becker R, Selden G. The Body Electric: Electromagnetism and the foundation of life. HarperCollins, New York, USA; 1998.
2. Tyler SE. Nature's electric potential: A systematic review of the role of bioelectricity in wound healing and regenerative processes in animals, humans, and plants. *Front Physiol* 2017;8:627.
3. Foletti A, Grimaldi S, Lisi A, Ledda M, Liboff AR. Bioelectromagnetic medicine: The role of resonance signaling. *Electromagn Biol Med* 2013;32:484-99.
4. Zhadin MN, Fesenko EE. Ionic cyclotron resonance in biomolecules. *Biomed Sci* 1990;1:245-50.
5. Available from: <http://www.lakhovsky.com/>. [Downloaded on 2017 Sep 21].
6. Muehsam D, Ventura C. Life rhythm as a symphony of oscillatory patterns: Electromagnetic energy and sound vibration modulates gene expression for biological signaling and healing. *Glob Adv Health Med* 2014;3:40-55.
7. Jáklí A, Harden J, Notz C, Bailey C. Piezoelectricity of phospholipids: A possible mechanism for mechanoreception and magnetoreception in biology. *J Liq Cryst* 2008;35:395-400.
8. Srinivasan TM. Model, methods and perspectives in Yoga. Bengaluru: Swami Vivekananda Yoga Prakashana; 2017. p. 36.

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