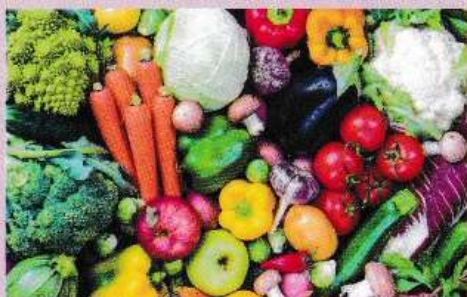
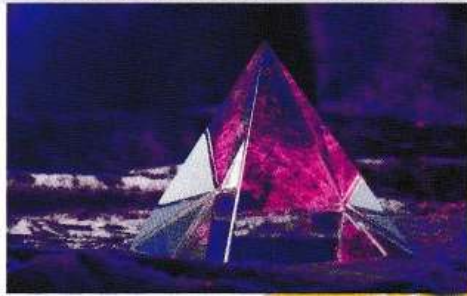


Nutrition and Integrative Medicine

A Primer for Clinicians



Edited by
Aruna Bakhru, MD, FACP



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PROTECTION FROM ENVIRONMENTAL ELECTROMAGNETIC FIELDS

Studies of the properties of light and space have practical implications for individuals who suffer from electromagnetic sensitivity. This is a definite medical condition that has been fully recognized in some countries (e.g., Sweden) as a disability attributed to the electromagnetic environment, specifically to increasing levels of radiation from cellular telephones and Wi-Fi, as was described above.

To understand these phenomena, it is of interest to determine the ways light and other kinds of electromagnetic fields traverse the skin to enter the body.

The technical issue is known as impedance matching. This is an electrical engineering term referring to the efficient transfer of energy from one medium to another, for example from air to the body. Impedance is the opposition of a system to the flow of energy from a source. In terms of electromagnetic fields and the human body, a valuable perspective is provided in a U.S. patent awarded to Charlene A. Boehm (2007). The patent provides methods for correcting for the fact that the electrical permittivity in living body tissue is not the same as for air. Permittivity is a measure of the resistance that is encountered when forming an electric field in a medium.

A valuable device for protecting sensitive individuals from electromagnetic pollution has been developed in Spain (Figure 27.13). Many devices claiming to protect from harmful electromagnetic fields can be found on the World Wide Web, but the PRANAN technology appears to have especially careful scientific research to support its safety and effectiveness. It is thought that the device converts potentially harmful environmental fields into fields that are normal and beneficial for the body. Evidence for this comes from many studies in leading Spanish university research departments showing improvements in physiological parameters while wearing the device (see Figures 27.14 and 27.15 from Escames 2011 and Alonso and Robayo 2012). Other studies analyzed cortisol, melatonin, lipid peroxidation, nitric oxide, pro-inflammatory and anti-inflammatory cytokines, the glutathione reduced/oxidized ratio, glutathione peroxidase, glutathione reductase, superoxide dismutase, and 6-Sulfatoximelatonin.³ Taken together, the studies document that the Pranan Technologies provide an excellent defense against oxidative stress and inflammation caused by “electropollution.” The results reported thus far have been obtained in a population of normal subjects, with no diseases or drug therapy. Thus, in subjects who present an oxidative stress/inflammatory condition, the beneficial effects of technology would be expected to be even more striking.

In designing the device, considerable effort was made in selecting the proper materials and defining the appropriate geometry for the front, back, and interior of the device to maximize effectiveness. One side of the device, shown to the left of Figure 27.13C, has an interesting pattern that corresponds to an ancient image found throughout nature, art, and architecture. Very early

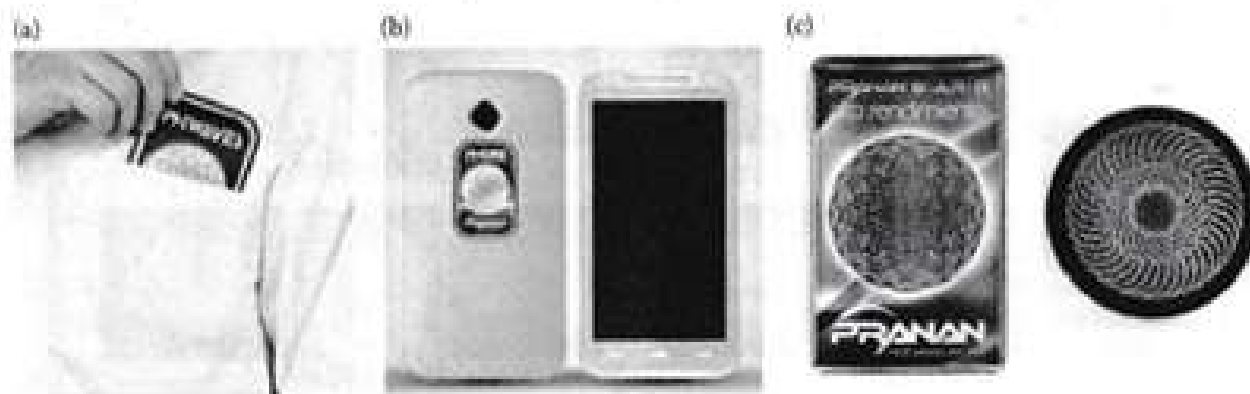


FIGURE 27.13 A valuable device for protecting sensitive individuals from electromagnetic pollution has been developed in Spain. Several studies support its safety and effectiveness. It is thought that the device converts potentially harmful environmental fields into fields that are normal and beneficial for the body. The evidence comes from studies in leading Spanish University research departments showing improvements in physiological parameters while wearing the device (Figures 27.14 and 27.15).

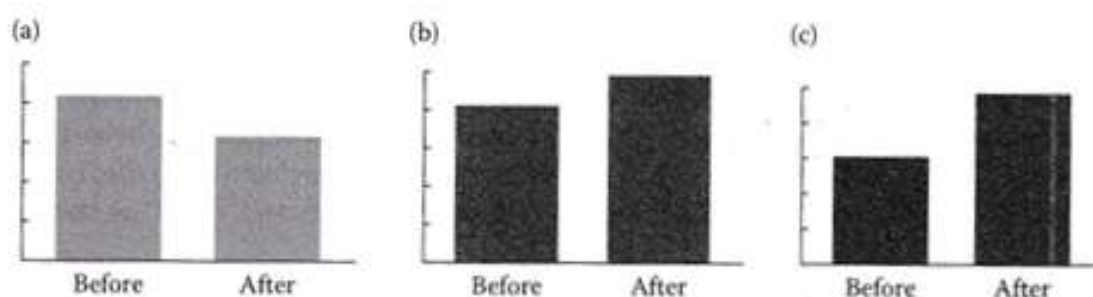


FIGURE 27.14 Examples of tests of the PRANAN device. All measurements taken from blood samples in 5 subjects before and after 30 days of daily use of PRANAN devices. (a) Lipid peroxidation index decreased by 33.47%. (b) Intracellular reduced glutathione increased by 16.28%. (c) Ratio of reduced/oxidized glutathione increased by 64.81%. These measures are considered important indicators of oxidative stress. (Adapted from Escames, G. 2011. Evaluation of neutralization of low intensity radiation harmful effects on five subjects cells redox markers. *Research Report to PRANAN* Dated June 3, 2011.)

representations of this design can be found in an ancient Egyptian temple (Figure 27.16a). More modern representations were produced to represent cosmological patterns recognized by the early astronomers Giordano Bruno and Johannes Kepler (see Figure 27.16b and c). This is a geometry that is thought to represent mathematical principles at work throughout nature (Goldstein Schappacher and Schwermer 2007). Many scholars have evaluated these patterns and concluded that they may relate to a fundamental geometric aspect of time and space (Calter 1998). For more information on this topic, see Oschman and Oschman (2015a,b).

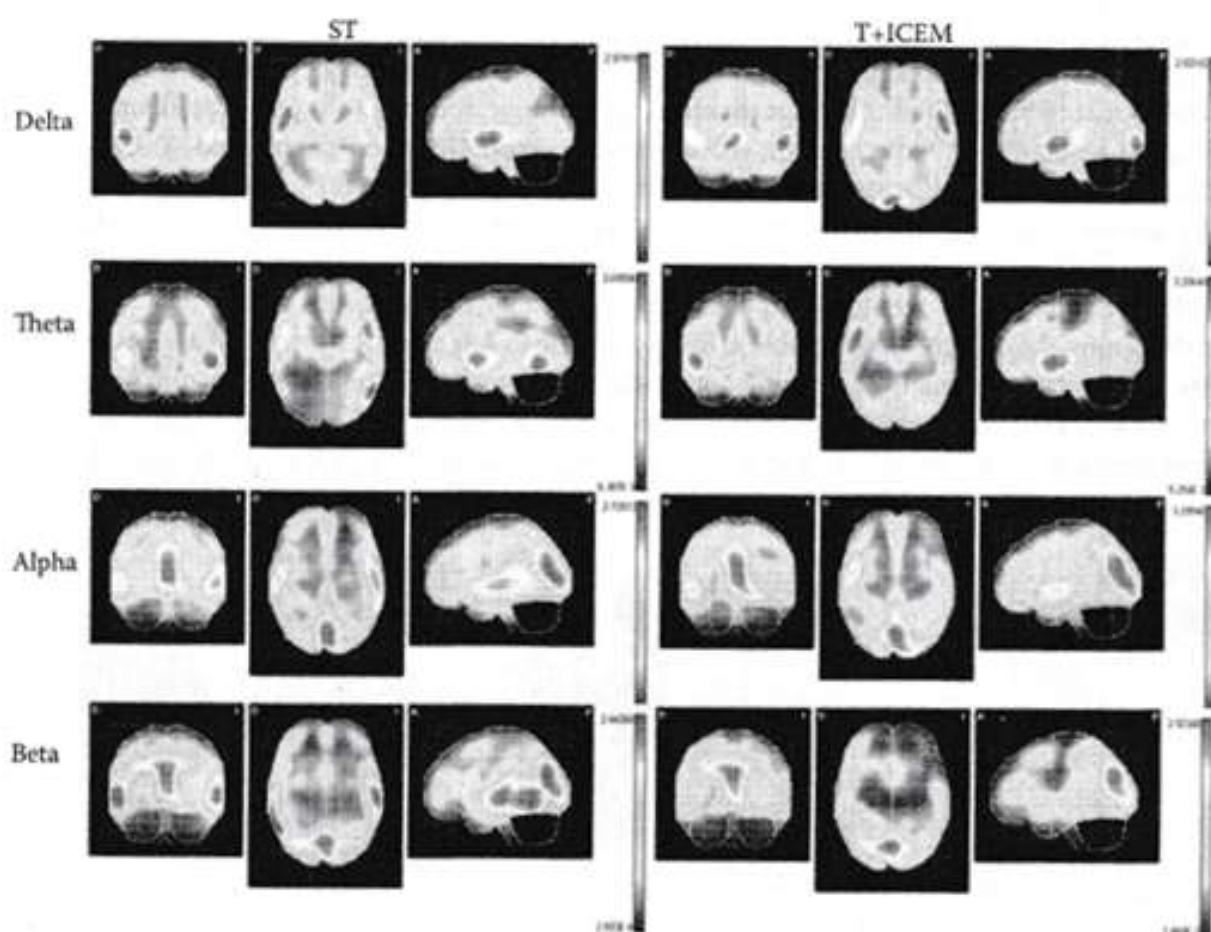


FIGURE 27.15 EEG brain bioelectrical activity in the phone only condition (left) and in the phone with PRANAN device (right). (Adapted from Alonso, T.O. and A.M.M. Robayo, 2012. Effect of external inhibition in electromagnetic exposures to radio frequencies emitted by mobile phones on the EEG brain bioelectrical activity. *Report to PRANAN* Dated July 24, 2012.)

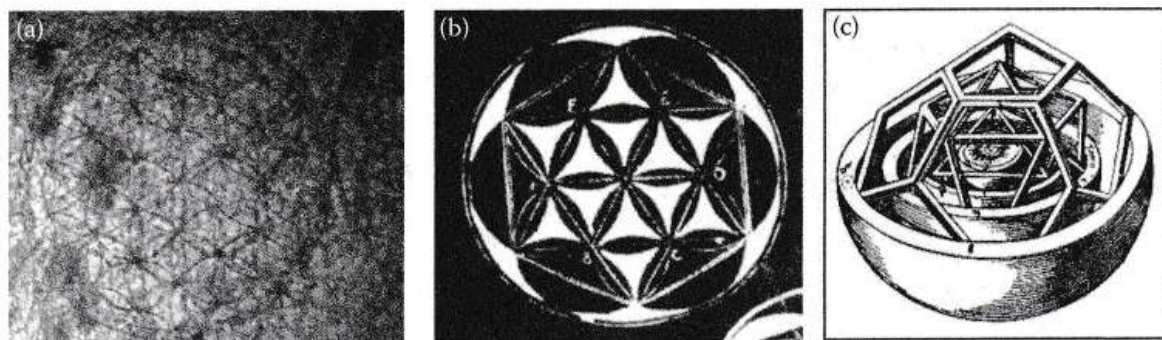


FIGURE 27.16 (a) The design on the face of the PRANAN device (Figure 27.11c) resembles an ancient relief found in the 6,000 year old Osirian Temple in Abydos, Egypt. The temple was a subterranean complex thought to be the oldest of all the ancient Egyptian ruins. The symbol is carved with laser-like accuracy on huge granite blocks in the temple walls. (b) A more modern image created in a woodcut by Italian philosopher, mathematician, poet, and cosmologist, Giordano Bruno from Bruno's *Articuli centum et sexaginta adversus huius tempestatis mathematicos atque philosophos* (1588). (c) Inner section of German mathematician and astronomer Johannes Kepler's Platonic solid model of planetary spacing in the Solar system, from *Mysterium Cosmographicum* (1596).

THE HOLISTIC ANATOMICAL PERSPECTIVE

Next we introduce an anatomical perspective on the human body. When we refer to “anatomy” we consider all levels of scale, from the environment to the organism as a whole, organs, tissues, cells, membranes, organelles, molecules, atoms, and, finally, to the quantum level of organization, including the fabric of space that interpenetrates all of the parts—the same space that extends to and interpenetrates distant stars and galaxies.

In spite of much biomedical research, modern medicine has a limited perspective on anatomy because of its primary focus on biochemistry and pharmacology. In contrast, the so-called integrative therapies, which are rapidly growing in popularity world-wide, include a variety of anatomical and energetic concepts that can lead us to new perspectives on chronic and degenerative diseases. Some people rule out Energy Medicine because of an unfounded rumor that these approaches lack a scientific basis. Actually there is an abundance of scientific support for Energy Medicine (Oschman 2000, 2016) and study of energetics opens up many exciting new opportunities for further research and clinical progress. Holism can be studied holistically, that is, by bringing in and integrating as many perspectives as possible. We introduce next an over-arching anatomical concept known as tensegrity.

TENSEGRITY

A systemic perspective on energetic anatomy can begin with tensegrity (Figure 27.17) the structural concept developed by sculptor Kenneth Snelson and further advanced by the famous designer, architect, engineer, mathematician, philosopher, and poet, Buckminster Fuller (1895–1983):

Fuller defined a tensegrity system as a continuous tensional network (tendons) supported by a discontinuous set of compressive elements (struts). Snelson preferred a highly descriptive term, “floating compression.”

Tensegrity provides a universal set of building rules that guides the design of organic and human-made structures from simple carbon compounds to complex cells and tissues.

Discontinuous compression and continuous tension enable the construction of multi-story towers and large-scale exoskeletons of wire and steel, for example, geodesic domes. They are dramatic examples of the idea that tension and compression can be complementary elements in any structure.