



RESEARCH ARTICLE

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Simplified Kundalini Yoga and EEG Frequencies

MK DHAMODHARAN*

World Community Service Center, Chennai, Tamilnadu State, India

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ABSTRACT

The practice of yoga brings mind to a calm state through direct experience. Therefore, mind may be defined as a wave, which has different frequencies. We call them 'mind frequencies'. The foundation of this research is based on the hypothesis that, "it is impossible to separate the waves of the mind and the brain". The hypothesis is tested using EEG measurements involving a systematic system of meditation called Simplified Kundalini Yoga (SKY). Briefly, the SKY system enables a meditator to bring the life force from the Mooladhar Chakra, which is located at the base of one's spinal cord, to "two higher chakras" located in the head, where the mind waves are said to attain lower frequencies. The EEG measurements show three ranges of lower mental frequencies corresponding to the three stages in the SKY meditation system. The results of EEG frequencies reported here correspond to the values in the modern scientific literature on brain frequencies. Therefore, our finding supports the hypothesis that mind and brain frequencies cannot be separated. I present EMG results that demonstrate how the peace of mind also pacifies the body.

Keywords: Simplified Kundalini Yoga (SKY), Life Force or Bio electricity, Bio-ElectroMagnetism, Periphery.

Introduction

Inquiry into the mind, its origin and its functions, has a long tradition in the ancient science of Yoga and Indian philosophy [1]. The practice of yoga brings mind to a calm state through direct experience. Therefore, mind may be defined as a wave, and the 'calm state as depicting low frequency'. By contrast, an angry mind depicts high frequency. We call them 'mind frequencies'. A galaxy of outstanding modern day yogis like Ramakrishna Paramahansa, Swami Vivekananda, Parmahansa Yogananda, Ramana Maharshi, Shri Aurobindo Ghosh, Anandamayi Ma, and many more, helped to revive the ancient teachings of Yoga. There is an extensive literature on the teachings of these yogis that is not cited here because it is outside the scope of our paper. Likewise, an extensive literature around the contemporary fields of Psychology, Neurology, Psychosomatic disorders and mind-body medicine, which focus

on understanding mind, are not reviewed here. The study of brain in modern science is yielding many new insights. For example, Electroencephalogram (EEG) places electrodes on human head and measures the electromagnetic (EM) activity of brain as *frequencies* [2,3]. Therefore, the electrical nature of brain is well accepted in modern science. How are the brain and mind frequencies related? It is a big question, because brain is material but mind is not, and therefore it is not the same as brain [4]. Our Paper is focused on testing the hypothesis that "it is impossible to separate the frequencies of the mind and the brain waves."

Thousands of years ago, the great Rishi Patanjali defined yoga in his famous 196 yoga sutras as, "Yoga is the inhibition of the modifications of the mind" [1]. Yogiraj Vethathiri Maharishi (1911-2006), a contemporary philosopher from the Southern State of Tamil Nadu in India, pioneered the Simplified Kundalini Yoga (SKY) system. He established the World Community Service Center (WCSC) in 1958, which is devoted to teaching SKY to an average householder. A web portal for WCSC is given in [5]. It includes the VISION academic program established in 2004, which offers MS and PhD degree programs in Yoga for human excellence, in collaboration with public and private academic institutions.

*Corresponding Author

MK Dhamodharan

Professor and Director, SMART

World Community Service Center, Chennai, Tamilnadu, India

Email: wsc.smart@gmail.com



The inseparable activities of the brain and the mind require a thorough knowledge of both of them. It is like music that depends both on the instrument and the wind. In the absence of either the wind or the instrument, melody is impossible. Yogiraj Vethathiri Maharishi has explained what mind is [6]. The hypothesis of inseparability of mind and brain frequencies is tested in this paper using EEG and the SKY system.

The rest of the paper is organized as follows. Section-2 gives background on EEG and SKY. Section-3 describes experiments on measuring EEG Frequencies and brain voltage map in three different stages of SKY meditation. Section-4 gives details of Electromyography (EMG) and explains how peace of mind also pacifies the body. Section-5 discusses the results. Section-6 briefly gives a summary of two studies that applied the SKY meditation in Theta frequency to agriculture. The paper concludes with self-healing, a key topic for future research.

Brief Background on EEG and SKY

EEG is an investigative tool in the study of brain function. Hans Berger a psychiatrist first used it in 1929. He is regarded as the founder of this medical specialty. EEG is the fancy polygraph of the brain. An EEG record has certain rhythm and magnitude. The rhythm of the EEG is classified according to the frequency and has been designated as Beta, Alpha, Theta and Delta [2,3]. The frequency is measured in cycles per second (cps), Delta is the slowest of synchronized rhythm, 1 - 3 cps. Theta measures 4 - 7 cps, and Alpha 8 - 13 cps. The frequency in normal day-to-day activities is high, and is known as Beta >15 cps. The rhythm observed for normal human sleep is approximately 14-15 cps, known as Sigma. People start to feel sleepy soon after they begin meditation, because a frequency transition occurs from Beta to Sigma.

The SKY meditation is based on linking one's mind with the life force, which is known as the *Kundalini energy* in the yoga literature [6]. Vora calls life-force as *bioelectricity*, and elaborates its significance in the context of the ancient sciences of *Acupressure* and *Yoga* [7]. SKY meditation is a systematic and streamlined practice that enables one to turn the mind inwards from its external sensory activities. The first stage is to bring the Kundalini power from the *Mooladhar chakra* at the base of the spinal cord to the *Agna chakra* in between the eyebrows. Meditation on Agna improves awareness and concentration. The second stage is *Shanti*, in which the Kundalini energy is taken back to the Mooladhar chakra. It slows down and controls the excessive flow of energy and helps to relax the body. The third stage is *Thuriya*, where the Kundalini power is raised to the *Sahasradara chakra*, which is located on top of the head. The mind relaxes further, and prepares itself to merge with the primordial state of existence, which is the state of *non-duality* and realization of consciousness. Yogis call Sahasradara as the gateway to the primordial state, or the *Almighty*. A person understands the value of existence in Thuriya. The fourth stage of SKY is *Thuriateetha*, which requires meditation outside the physical

body. In this stage, first the mind merges with the *universal field*, and then with the Almighty. A detailed explanation of the SKY meditation system is given in [8]. The EEG experiments reported here exclude Shanti, the second stage of SKY meditation but include the other three stages mentioned above. Shanti is not pertinent within the scope of testing our hypothesis.

Yogiraj Vethathiri Maharishi defined life force or bioelectricity as a group of very minute fundamental energy particles called, "Vethons" [8], which circulate throughout the physical body of all living beings from one cell to the multi-cellular human beings. Vethons may be formally compared to the flow of electrons in a wire that carries electricity. An electric current passing through a wire generates magnetic field, which is known as ElectroMagnetism (EM) in Physics [9]. Similarly, bioelectricity generates *Bio-ElectroMagnetism* (BioEM), which is analogous to EM that electric current produces. Indeed, Waechter [10] based on an extensive and an independent review of the modern scientific literature hypothesized that "Qi" or the life-force, is either the same or closely related to the modern concept of BioEM energy.

Yogiraj Vethathiri Maharishi called BioEM as Bio-magnetism [11]. He postulated that Bio-magnetism is needed for carrying out involuntary functions like breathing, digesting food etc., as well as voluntary functions involving all the five senses and the mind [6, 8]. Vethathiri's concept of bio-magnetism is consistent with similar insights in the ancient science of yoga that Rishi Patanjali explained as the "waves or tanmatras or sensations" [1, Diagram on p.268], which correspond to the five elements and the five sense organs (smell, taste, eye, touch, hearing). The role of mind in perceiving these sensations is explained in detail in [1]. Similarly, Vethathiri explained how bio-magnetism is transformed into the five senses and the mind [8].

EEG Experiment with Simplified Kundalini Yoga

The researcher is a senior professor of the SKY system and conducted this research on himself. EEG experiment consisted of placing 20 electrodes on different parts of the head, fingers, and ears. The researcher sat on a wooden box of 3' height. Mind waves registered a normal reading for the first five minutes in the experiment. His eyes were open, and the EEG monitor recorded Beta frequency >15cps, as shown in Figure-1. It is called the sensory activity of mind.

The first stage in the SKY meditation is to withdraw the mind from its sensory activities and bring the Kundalini power from



Figure 1: EEG pattern of Beta Frequency

the Mooladhar chakra at the base of the spinal cord to the Agna chakra in between the eyebrows. The researcher closed his eyes and concentrated on the Agna chakra for the next five minutes. The sensory feelings gradually diminished, and the EEG recorded Alpha frequency of 8-13 cps, as shown in Figure 2.

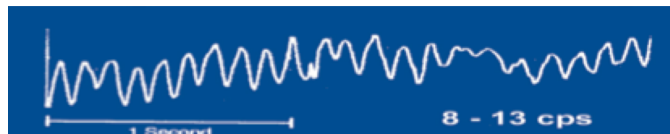


Figure 2: EEG pattern of Alpha Frequency

To give a spatial representation to the EEG data, a voltage map was created, which represents the measurement of electrical patterns at the surface of the scalp. It reflects the cortical activity that is commonly referred to as “brain waves”. The voltmeter amplifies and records the potential difference between the pairs of connected electrodes including one connected with ear. Voltage map is the spatial representations of the brain. The EEG instrument records the voltage electrical pattern in an analogous way. The computer studies the waves and gives a map like picture in terms of different colors as shown in Fig-3. A scale adjacent to map represents -100 micro units of voltage (UV) to +100 micro units of voltage. Out of 12 colors in this scale, the sixth (pink) and seventh (yellow) colors represent neutral voltage, which means the frequency at the neutral level is zero.

In Agna meditation, the colors yellow & pink representing the

neutral level lie at the periphery. The EEG Voltage map recorded at Alpha frequency is shown in the Figure 3. It experimentally demonstrates the statement of Yogiraj Vethathiri Maharishi [12] that the Agna Meditation controls the peripheral mind, which is in a serene state.

Experience of a large number of SKY meditators has shown that meditation on Agna improves awareness and concentration. It enables the practitioner to withdraw from external sensory activity that results in conserving life force [11]. It purifies and streamlines the mind, and it acquires more will power and sharpness of intelligence. Mind is able to control the sensual activities.

The third stage of SKY meditation is Thuriya, where the Kundalini power is raised to the Sahasradara chakra, which is located on top of the head. The researcher concentrated for five minutes at this chakra. The EEG recorded Theta frequency of 4-7 cps as shown in Figure 4.

In the Thuriya stage the voltage map shows that the central part of brain becomes pink & yellow, while the periphery shows higher voltage colors (blue) that represent higher frequencies. Thuriya Meditation controls the subconscious mind, which is Theta frequency, and the EEG Voltage map is



Figure 4: EEG pattern of Theta Frequency

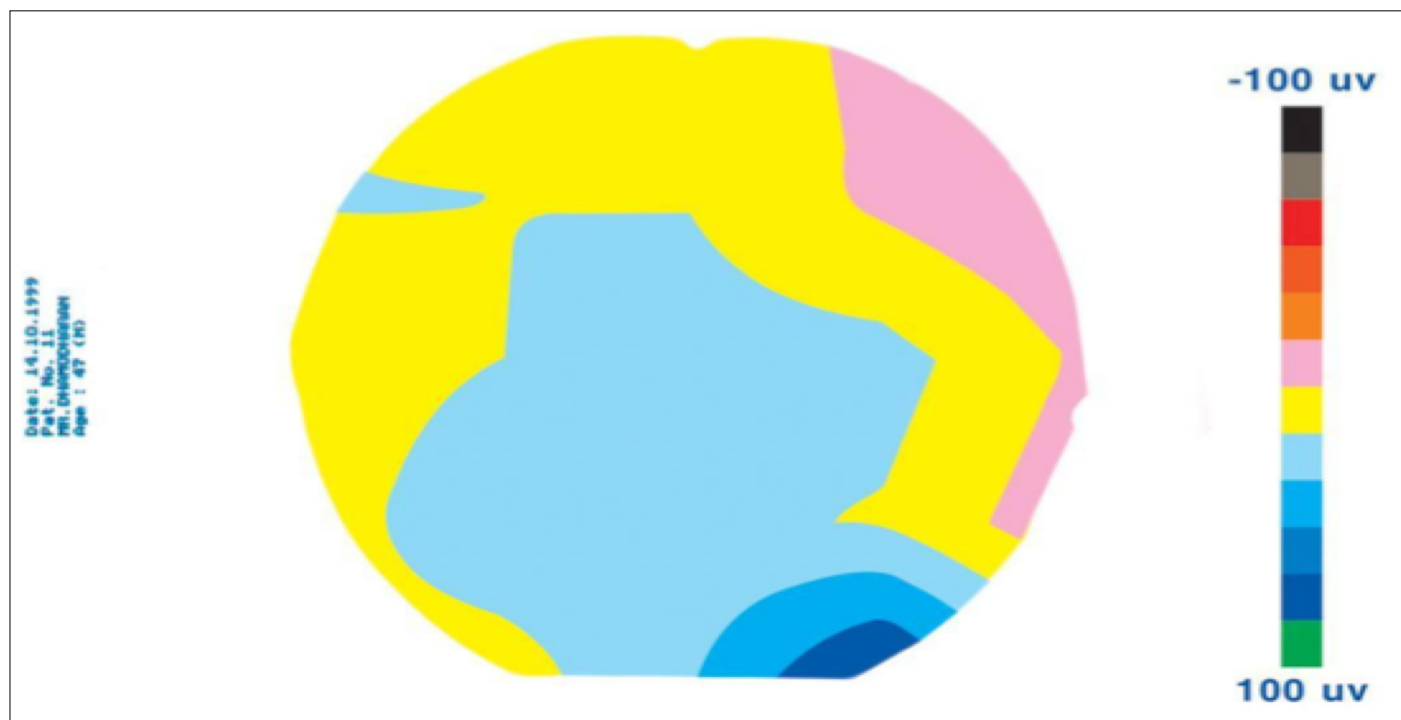


Figure 3: EEG Voltage map of Alpha Frequency

shown in Figure 5. The mind attains serenity in Thuriya Meditaion [12]. The mind prepares itself to merge with the primordial state of existence. Yogis call Sahasradara as the gateway to Almighty. One understands the value of ones own existence in Thuriya.

The fourth and the last stage of SKY meditation is Thuriyatheetha, which requires meditation outside the physical body. First the mind merges with the universal field, and then with the primordial state. The researcher conducted the Thuriyatheetha meditation for eleven to fifteen minutes, and the mind began to vibrate beyond the dualistic nature of reality. Thuriyatheetha provides the observational approach to experience the non- dual state of reality that was explained and written elaborately by the Ancient Indian sages. SKY streamlined the process for any meditator to experience this state of oneness, and the realization of consciousness [8]. EEG recorded Delta frequency of less than 4 cps as shown in Fig. 6. The voltage map shows that all of the mind frequencies attain the serene level representing yellow & pink colors in the map, as shown in Figure 7.



Figure 6: EEG pattern of Delta Frequency

Simplified Kundalini Yoga and EMG Frequencies

The mind, body and life force are interconnected. If one of the three is forceful, it affects the other two. Electromyography (EMG) demonstrates how the peace of mind also pacifies the body. EMG measures the tension and relaxation of the cells of the body. Usually before starting meditation, the muscles are tense. After meditation, the mind is relaxed and also the muscles are relaxed. Here mind, body and life force work together in coordination. To test this hypothesis, the researcher's fingers and toes were connected with the electrodes. Figure 8 records normal reading. Figure 9 records the Thuriatheetha state, which shows how the cells of the body are in a peaceful state according to the state of mind. If we meditate both morning and evening, serenity comes to mind, body, and life force. Diseases caused by tension are prevented. Let us practice meditation with enthusiasm.



Figure 8: EMG Pattern in normal state



Figure 9: EMG Pattern in Thuriatheetha state

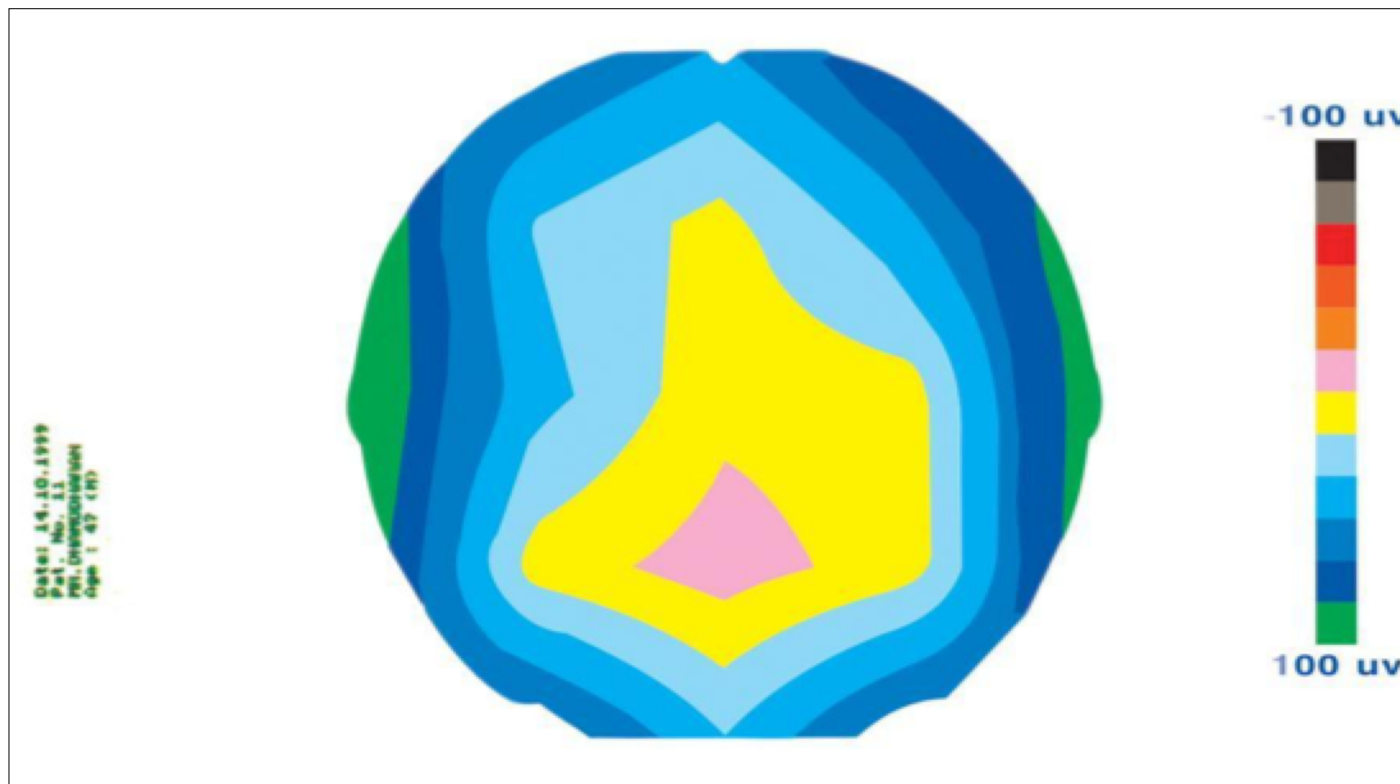


Figure 5: The EEG Voltage of Theta Frequency

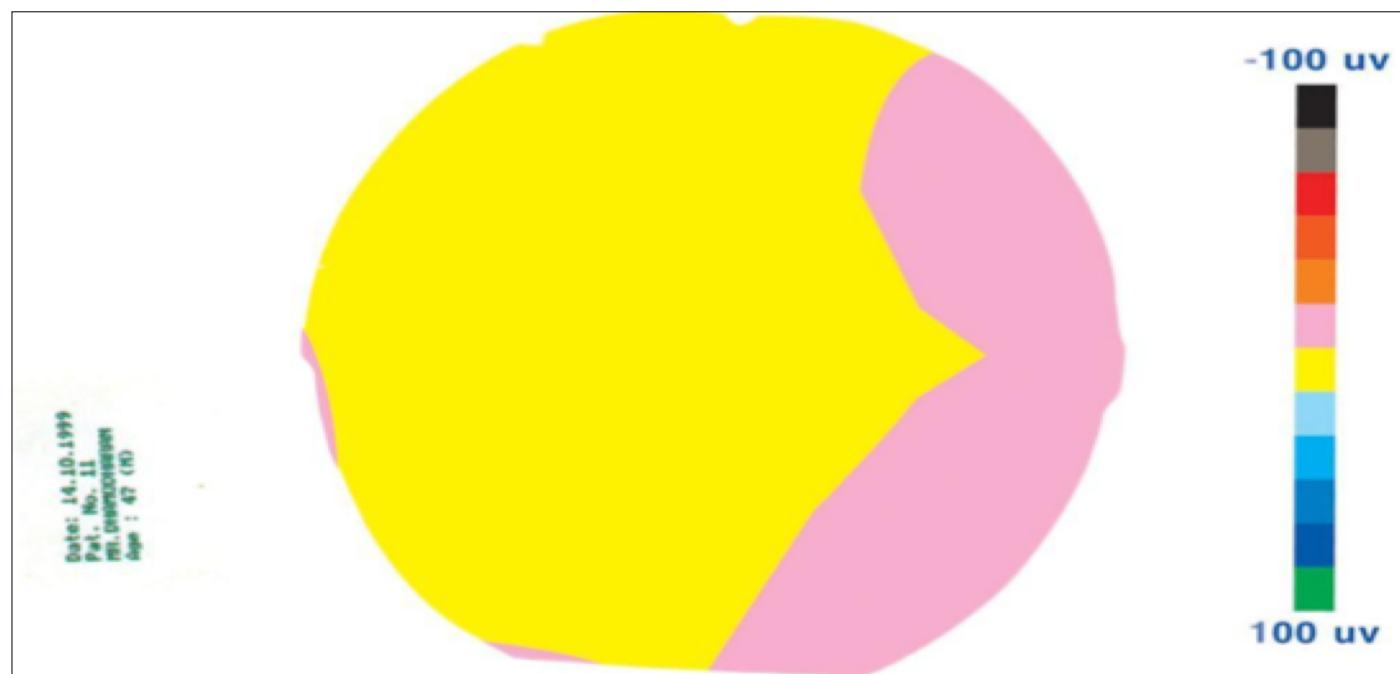


Figure 7: EEG Voltage of Delta Frequency

Discussion of Results

The results of our experiment show that mind frequencies at three different stages of SKY meditation are the same as the EEG, brain frequencies that, Lipton and Bhaerman [3] have listed. Our results are in complete agreement with theirs. It supports my hypothesis that the mind and brain frequencies cannot be separated. I present EMG results that demonstrate how the peace of mind also pacifies the body.

Applications

Two agricultural experiments have been conducted to test the effect of thought transaction on plants when mind is in Theta frequency [14, 15]. The experimenters used the Thuriya stage of SKY meditation. The research presented here shows that mind is in Theta frequency during Thuriya. Rajendran et al., [14] conducted a laboratory experiment using thought transaction on tomato plants that were infested with root-knot nematodes. The first set of treatments was done on plants with sterile soil without nematode that served as the control set. The second set of treatment was with inoculum level of 1000 larvae/plant that received no thought transaction. The last set of treatment was with 1000 larvae/plant with transaction of thought to plants.

After daily transaction for 45 days, the plants were examined for root growth, vigor and for the development of any root knots/galls due to nematode. The treated plants were observed to be healthy with more roots and without any galls compared to the control plant, and the plant non-transacted by thought. Thought transaction perceptibly enhanced plant growth characteristics and increased the vigor. The treated and untreated plants were subjected to biochemical analysis. It revealed increased chemical

stimulation that enhanced protein profiles and enzyme activities like peroxidase and polyphenol oxidase, which in turn were responsible for resisting the nematode invasion.

Letchoumanane and Gupta [15] conducted two field experiments to study the effects of thought transaction on okra yield in Thuriya stage of SKY meditation. The experiments were conducted at the Temple of Consciousness, Aliyar, Tamil Nadu, India. In addition, they used 3% *Panchagavya* described in the ancient science of Indian agriculture called *Vrikshayurveda*. Multiple replications were carried out in randomized block design, and statistical analyses were made to interpret their data. Thought transaction gave significantly higher yields, with or without the application of *Panchagavya*, than untreated control. Enemies like lady-bird beetle and hover flies naturally suppressed appearance of aphids, a sap-sucking pest noticed at 20 days after sowing the crop. The crops were found to be pest and disease free without application of any pesticides. Therefore, their research addresses an economically viable and safe crop production practice. This stands in direct contrast to the modern industrialized agricultural practices that are creating major adverse impacts on the human and the environmental health.

Self-healing: A Topic for Future Research

The application of the SKY meditation to agriculture raises a key question: How can the science of SKY meditation be used in a self-healing modality to cure various ailments and maintain healthy body and mind? SKY meditation is based on the endocrine system that is connected to the seven chakras in the body [16]. Vora has explained the science of the endocrine system in the context of acupuncture, the ancient Indian

science of self-healing [7]. Yogiraj Vethathiri Maharishi explicitly specified 'the nine-center meditation' for self-healing [16]. Other new research articles on the use of SKY practices for self-healing have been published [17-19]. This exciting line of research being undertaken has major implications for future generations to live and maintain a drug-free lifestyle. Results will be presented in the future.

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Authors Column

M. K. Dhamodharan is a senior professor of the World Community Service Centre, Chennai, India. He is the author of 16 books. He has been editing and publishing, 'Anbuneri' Tamil monthly journal since 1996. He is a researcher in siddha philosophy and in simplified Kundalini Yoga (SKY). Yogiraj Vethathiri Maharishi introduced the SKY system to him. He tours extensively sharing the universal message of SKY in industrial houses, management institutions and educational institutions for personality development, stress management, meditation and values. He currently is the Director of SKY masters selection and training wing of WCSC, and conducts SKY courses in India and internationally.