

Modernization of Traditional Medicine – High-Tech Laser Acupuncture

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Abstract

This short review article focuses on the latest innovative aspects concerning laser acupuncture and integrative laser medicine. The TCM Research Center has built up a high-tech acupuncture network with many partners from Asia. Within this network, teleacupuncture and tele-laseracupuncture is performed. In this article, some of the stimulation methods (laser acupuncture) and some of the recording techniques are shown.

Acupuncture has been used for treatment for thousands of years. A large number of empirical data are available but the technical quantification of effects was not possible up to now.

This short review article focuses on the latest innovative aspects that underline the further enhancement and development of acupuncture. Special emphasis is given to new methodological and technical investigations, for example, results obtained from all kinds of acupuncture innovations (e.g. laser acupuncture, teleacupuncture between Europe and Asia) and integrative laser medicine.

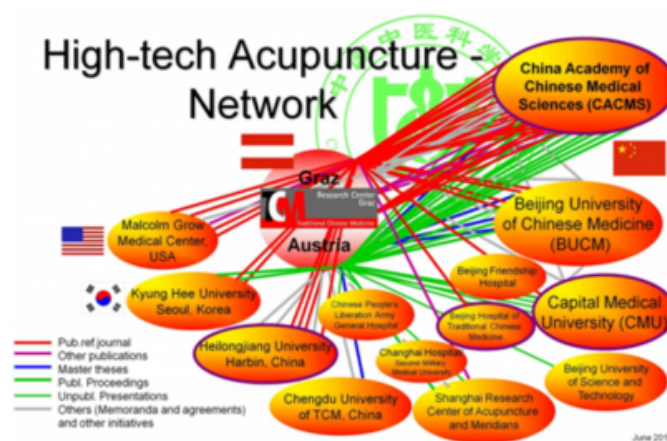
Basic, bioengineering translational and clinical research on modernization of acupuncture has been performed at the Medical University in Graz since 1997. In addition innovative systems of bioengineering assessment of acupuncture using high-tech methods will be presented. Besides the investigation of peripheral effects of acupuncture special emphasis is given to investigations of the central nervous system using transcranial ultrasound, near infrared spectroscopy, magnetic resonance imaging and bioelectrical methods. Analysis of heart rate variability completes the methodological spectrum.

Modernization of acupuncture, computer-controlled stimulation, computer-assisted recording acupuncture effects in the brain and also teleacupuncture are no longer future visions. In cooperation with Asia, research on this topic has already become reality and is proceeding with full speed at the Medical University of Graz [1-9].

Graz is to play a central role in laser acupuncture and traditional medicine research in Europe. The TCM Research Center Graz was founded in early March 2007. All research work in this center is done based on scientific methods. The research team is interested in basic research and those aspects of TCM that have not been given much attention so far, for example the objectivation of new acupuncture techniques such as painless laser acupuncture and electroacupuncture, as already mentioned above. Possible effects of acupuncture in combination with other methods are also subject to scientific research. Thus far, about 300 scientific studies and seven books have been published regarding high-tech acupuncture in Graz, mainly in cooperation with Asian researchers [10-13].

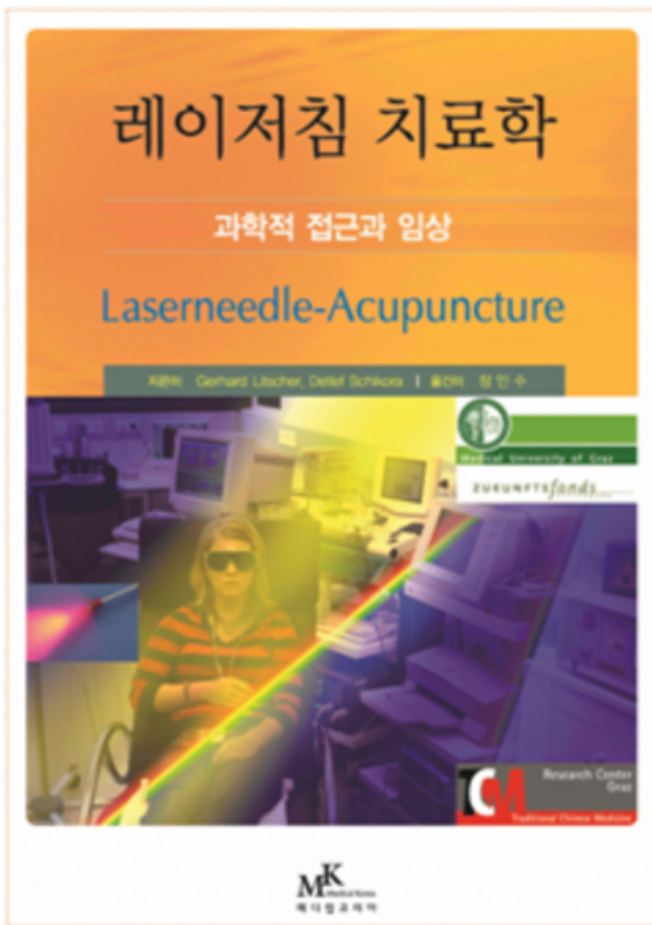
The team has built up the following international high-tech acupuncture network over the last few years:

Figure 1



The book “Laserneedle Acupuncture” has been published in German, English, and also in Korean language:

Figure 2



The latest book entitled “High-tech Acupuncture and Integrative Laser Medicine” has a scientific impact factor of about 62. It has been released in May 2012.

Figure 3



The scientific and technological progress has truly

revolutionized Eastern and Western experimental and clinical medicine recently. The last century was certainly the most innovative phase in medical history. At the Medical University of Graz, our TCM (Traditional Chinese Medicine) Research Center has made various efforts within the last 15 years to modernize acupuncture, one of the most spectacular of Eastern medical procedures. High-tech acupuncture comprises many different forms of stimulation and recording techniques.

Figure 4



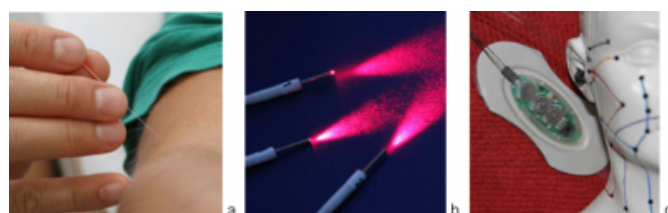
At the high-tech acupuncture laboratory at the Medical University of Graz, a broad spectrum of future-oriented bioengineering methods is used in joint projects with different leading acupuncture institutions in China (e.g. the Institute of Acupuncture and Moxibustion (head: Prof. Zhu Bing), China Academy of Chinese Medical Sciences). One can find an exemplary listing of important non-invasive procedures in the next Figure.

Figure 5



For the application of stimuli at the acupuncture points we use manual needle acupuncture (a), laser needle acupuncture (b) and electrical methods (c).

Figure 6



For current acupuncture research, the usage of advanced exploratory tools such as multidirectional transcranial Doppler ultrasound sonography, cerebral near infrared spectroscopy, functional magnetic resonance imaging, different bioelectrical methods and other highly sophisticated biomedical equipment, provides revealing insights. The obtained results are absolutely necessary for the acceptance of acupuncture by the Western medical community.

Traditional Medicine, especially laser acupuncture, has made many important contributions to the medicine of the world. Using needle, laser needle, electrical stimulation and modern biomedical recording techniques, changes in the brain and periphery can be quantified.

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