Conference Report

International Training Course on Application of Modern Scientific Techniques to Cellular Acupuncture Research

Shanghai, China
17 September to 1 October 2006

During September 2006, a two-week international training course – Application of Modern Scientific Techniques to Cellular Acupuncture Research – was conducted in Shanghai, China. The course, the first of its kind, was held at the Shanghai Research Centre for Acupuncture and Meridians, located in Pudong, Shanghai. The course's aim was to develop participants' laboratory research skills and disseminate research findings. Entry to the course was competitive and the course outline and application details were advertised on the Society for Acupuncture Research (USA) website as well as the Shanghai Research Centre website in China. The course was sponsored by a number of institutions including the World Federation of Acupuncture–Moxibustion Societies (WFAS), Chinese Academy of Sciences, Max Planck Society, Pudong Government (Shanghai), Shanghai University of Traditional Chinese Medicine, Fudan University and the Shanghai Research Centre for Acupuncture and Meridians.

The organising committee was international, headed up by Professor Wolfgang Schwarz (Max Planck Institute of Biophysics, Germany), and local organisers, Professor Wang Jianping (Shanghai Municipal Commission for Science and Technology), Professor Ding Guanghong (Director, Shanghai Research Centre for Acupuncture and Meridians) and Professor Li Wemin (Fudan University). Lecturers were also international, including Professors Johannes Greten (Germany), Nancy Midol (University of Nice, France) and Lao Lixing (University of Maryland) and Xia Ying (Yale University) both from the USA. Local lecturers were also involved, including Professors Cao Xiaoding (Fudan University), Fei Lun (Shanghai Research Centre for Acupuncture and Meridians) and Shen Xueyong (Shanghai University of Traditional Chinese Medicine).

As well as the international array of lecturers, the eighteen students enrolled in the course also came from a variety of different countries, including China, USA, Mongolia, Indonesia, Germany and Australia, giving a very international feel to the course.

The two-week course was divided into one week of lectures and presentations and one week of laboratory activities. Presentations formed the basis of the first week with a total of thirty presentation sessions over the week. The course was conducted entirely in English, with time allotted for questions after each session, which allowed for lively discussion. As the course title suggests, the focus was on research associated with elucidating the underlying mechanisms of acupuncture rather than clinical randomised controlled trial (RCT) research.

WEEK 1

Day 1 lectures focused on the evidence of the existence of acupoints and channels. In addition, a lecture on the role of genomics and proteomics and gene expression in asthmatic rats highlighted the novel role needle stimulation can have on the regulation of the whole body.

Day 2 concentrated on cell electrophysiology and the possibility of both acupuncture and moxibustion modulating charge movements across or within the cell membrane. In particular, mast cells, which occur at high density in acupoints, have been suggested to play a key role in that their membranes exhibit mechanically and temperature sensitive channels (P2X receptors) that can be investigated by electrophysiological techniques. The theory of the two-electrode voltage clamp (TEVC) and the patch clamp (PC) were presented to assist the practical sessions using the techniques to follow in the second week. Day 2 finished with a presentation from Dr Xia Ying on the possible protective mechanism of acupuncture from hypoxic/ischaemic brain injury.

Day 3 revolved around research associated with the glutamatergic and GABAergic systems and their role in pain suppression. The importance and involvement of both the GABA and glutamate systems, as a balancing process, were suggested as an important contribution to the effect of pain modulation produced by acupuncture. The next sessions given by Professor Ding, Director of the Shanghai Research Centre for Acupuncture and Meridians, detailed his research into the role of mast cells and tissue fluid

movement as a possible mechanism for acupuncture analgesia. He presented a very novel explanatory mechanism that may partially explain the role of mast cells (which he demonstrated were found in high concentrations in acupoints compared to non-acupoints), and their degranulation during needling, contribute to the acupuncture effect. Day 3 concluded with two sessions from Professor Cao Xiaoding from the WHO Collaborating Centre for Traditional Medicines, Shanghai Medical College of Fudan University. The oldest participant in the course, she reviewed her 1970s research as well as her more current projects on the effect of acupuncture on cell immune function.

Day 4 involved presentations from Professor Midol (France) and Dr Hu (France) on the anthropology of the body and gave some respite from the heavy science of the previous days. In addition, Professor Greten presented on his research involving peripheral blood perfusion as recorded by tissue spectrophotometry. Finally on Day 5, Professor Lao (University of Maryland) presented on the use of animal research models and their role in investigating the effects of acupuncture on pain. Professor Lao, a well-known clinical trial researcher, was also a key-note speaker at a previous Australian acupuncture and Chinese herbal medicine conference (AACMAC 2005). His series of research projects were well developed with specific questions being asked and partially answered with each study, and highlighted the valuable role that animal research could play in addressing the acupuncture mechanism.

WEEK 2

At the start of the second week, all the participants were eager to move into the laboratory and put into play some of the techniques they had been listening to. Laboratory highlights were the sessions involving the patch clamping of frog cells (oocytes), conducted by Dr Rettinger and Professor Schwarz, and the Western Blot (identification of protein chains) sessions. Week 2 also involved visits to Fudan University to demonstrate the concentration of specific elements (Ca, P, K, Fe, Zn) in connective tissue using Proton Induced X-ray Emission (PIXE) and a quick visit to Yue Yang Hospital of Traditional Chinese Medicine. Interspersed over the two weeks were a number of formal dinners as well as informal discussions that contributed to a very informative and rich educational experience. Costs to participants were minimal (US$50) with the aforementioned supporting institutions covering most expenses, including accommodation, food and course costs. The organisers are to be congratulated on organising and conducting such a novel and interesting course.

In retrospect, participants came away with a sense that acupuncture probably has a number of diverse and integrated mechanisms that contribute to the wide variety of effects seen during treatment. The need to complement good clinical research, black-box-type approaches, with specific-mechanism-type research at the cellular level, is essential if acupuncture is to be accepted by Western and scientific researchers.

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