



**Good Practice in Traditional Chinese Medicine Research in  
the Post-genomic Era**

**GP-TCM**

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**Primary report on pitfalls and solutions for functional  
genomics studies of acupuncture**

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# 1 PRIMARY REPORT ON PITFALLS AND SOLUTIONS FOR FUNCTIONAL GENOMICS STUDIES OF ACUPUNCTURE

## 1.1 Background

Acupuncture, makes an important contribution to TCM, and patients report that it is effective in relieving many symptoms of disease. Scientific evidence of its effectiveness is increasing and it is receiving increasing acceptance in Western countries, including EU member states. The efficacy of acupuncture and moxibustion in the regulation of critical functional genes has been reported in the treatment of diseases. Recent studies have shown that the therapeutic effects of acupuncture involves various cellular protein factors or signal transduction pathways which are associated with inflammatory responses, redox regulation and apoptosis. Some selected molecular markers and subjective parameters have been used to interpret the mechanisms of this therapy, however, many of the mechanisms underlying acupuncture remain obscure.

To further investigate the roles of these factors, pathways, and their inter-connections it would be valuable to carry out research using emerging new technologies and high-throughput genomics, proteomics and metabolomics analysis technologies which have created opportunities for these studies. This may tell us about the mechanisms that underlie acupuncture. We intend to develop a strategy that will allow us to dissect the molecular mechanisms of acupuncture allowing us to better understand acupuncture within a modern biomedical framework.

## 1.2 Aims

The overall objective of this work package is to optimise and standardise acupuncture protocols and discuss the application of the functional genomics approach to examine the efficacy of acupuncture and moxibustion for the treatment of common diseases in the EU countries and China. Specific objectives will be outlined as follows.

- To establish a communication and collaboration platform to evaluate the current status of acupuncture research and practice in both China and EU
- To define prioritised research areas or topics in acupuncture that are appropriate for conducting functional genomic studies
- To collate and evaluate systematic reviews of acupuncture for "difficult diseases".
- To focus future research strategies within appropriate areas for functional genomics

## 1.3 Methods

As many of the WP8 participants and invited specialists already have the research skills and experience, the WP8 lead will encourage the members to utilise and rely on the currently available materials rather than producing new sets of data under the scope of the whole GP-TCM project. Hence, it has been agreed upon making the best use of the data from currently available literature.

Initially, the literature on the status of current acupuncture/moxibustion will cover appropriate indications, research methodologies, promising studies on the mechanisms of acupuncture/moxibustion, the latest progress and application for future developments. Subsequently, drafted literature reviews for publication will be constructed based on genomic studies or systematic reviews. Finally, practical

research proposals will be produced for further basic/clinical studies of acupuncture/moxibustion in the post-genomic era.

### **The investigation focuses on the following two issues:**

#### (1) Clinical research on acupuncture-moxibustion: the gap between practitioner experience and research evidence

The steps being taken were as follows:

- Focussing on one or more specific subject areas with a Cochrane/Systematic or meta analysis with acupuncture as an intervention Collecting and summarising all current Cochrane Collaboration reviews on acupuncture and any relevant current systematic reviews by involving WP8 members. Analysis of the WP6/8 survey of practitioners will help to identify areas where more evidence is required, which conditions practitioners believe would be useful to explore in terms of clinical benefit and where future research should be focussed.
- The PRISMA guidelines for reporting of systematic reviews are being used to evaluate the quality and reporting of the review and the information collated.
- A SURVEY MONKEY electronic data extraction form based on the PRISMA guidelines with simple tick boxes has been specially designed and will provide an easier option for people to carry out the review of systematic reviews. In addition, this will provide a central, standardised repository for the extracted data which will be accessible as a result. A protocol will be required detailing quality criteria for inclusion of relevant systematic reviews including those in Chinese literature.

#### (2) Basic research on acupuncture-moxibustion and meridian

The approach taken is as follows:

- To collect and summarise all recent advances on the use of functional genomics analyses in acupuncture-moxibustion studies.
- To develop strategies and investigate the potential to combine modern medical technologies to explore descriptive, integrated and in-depth acupuncture-moxibustion studies will be discussed and proposed.
- Joint basic/clinical research meeting to discuss the preliminary data from functional genomics as a potential strategy to studies the pan-genomic gene regulation in respond to acupuncture stimulations, and to evaluate the application of systems biology in related research.

### **1.4 Results**

WP8 agreed that to cover the enormous body of literature for acupuncture and moxibustion and safety is not possible and would be problematic.

#### **Main focuses of the proposed review:**

**WP8 Review 1:** Clinical research on acupuncture-moxibustion: the gap between practitioner experience and research evidence

(“**Corresponding author**”: Prof. Nicky Robinson, in liaison with all WP8 members)



- A survey of acupuncture-moxibustion practitioners through GP-TCM identified evidence gaps in research for certain clinical conditions. There are differences between practitioners within the EU and China regarding which conditions they commonly treat. These acupuncture-moxibustion practitioners have also indicated which conditions they feel should be targeted for future clinical trial development.
- A literature synthesis of acupuncture Cochrane reviews has also provided information on the quality of available evidence on the significance of clinical trials of acupuncture. This, together with evidence from other systematic reviews and meta analysis will also inform the focus of future clinical trials. The potential opportunities to combine modern medical technologies to explore acupuncture-moxibustion studies will be discussed.
- Any applications of omics in clinical studies, if relevant will be investigated and perspectives reviewed

**WP8 Review 2:** The current understanding of acupuncture-Moxibustion and meridians (**Corresponding author**": Prof. Wei Ding, in liaison with all WP8 members)

- The nature of acupuncture points and meridians – What do we know so far?
- Theoretical and basic research: In-silico, in-vitro and in-vivo models –State of the art, promises and pitfalls
- Modern research methodology? Are there enough “omics” data? Review and perspectives

### **1.5 Outcomes**

The information collected will be written up for publication in the Journal of Ethnopharmacology special issue and other scientific journals.

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