THE JOURNAL OF ALTERNATIVE AND COMPLEMENTARY MEDICINE
Volume 11, Number 1, 2005, pp. 171–173
© Mary Ann Liebert, Inc.

Biophotonics in the Infrared Spectral Range Reveal Acupuncture Meridian Structure of the Body

KLAUS-PETER SCHLEBUSCH, Ph.D., WALBURG MARIC-OEHLER, Ph.D., and FRITZ-ALBERT POPP, Ph.D.

ABSTRACT

This study shows, for the first time, evidence of the existence of the acupuncture meridian structure in the human body. After moxibustion (or similar light stimulation) of the body in the 3–5 μm range, "light channels" appear on the body, which appear to be identical to what are known as meridians in all textbooks of Traditional Chinese Medicine. These findings appear not only to confirm the existence of acupuncture meridians, but they also open a new window on understanding the energy transfer dynamics of the human body. Furthermore, it is likely that living matter is not in the ground state, but permanently electronically excited.

INTRODUCTION

Evidence for the existence of acupuncture meridians has proven to be an elusive goal. There is an extensive literature concerning trials to provide this evidence (Li, 1984). Some papers demonstrate significantly different skin resistance values for acupuncture points compared to immediately surrounding areas (Wolfson, 2003). However, in view of continuing skepticism, clear evidence of the existence of meridians would certainly be considered an important contribution to this topic, both in acupuncture and in medicine in general. Such evidence is offered here. The significance of these findings calls for urgent replication and development of the results. These results, if confirmed, offer the potential for the development of noninvasive diagnostic and therapeutic tools.

METHODS AND MATERIALS

Using a standard method of infrared thermography and an Inframetrics/FLIR Therma Cam PM 290 (American Infrared, Old Forge, NY) extended infrared camera model, sensitive between 3.4 μm and 5 μm in the temperature range from 10°C to 450°C, the heat radiation of the human body can be recorded and analyzed online. Details of the procedure can be found at www.flir.com.

Using this technique, typical and well-recognized images of heat radiation, displaying normal temperature profiles from 20°C to 40°C, and also differing features of non-homogeneous temperature distributions over the body surface, are generated. In addition, one can occasionally observe unexpected temperature gradients on the skin, though at present these patterns are not well understood, nor can they be interpreted in terms of useful diagnostic assessments.

However, the method used here demonstrates that after burning a moxibustion stick as a directed heat source in a defined manner, in proximity to a body region where there is purported to be an acupuncture point, the meridian structure can be completely revealed. Figure 1 demonstrates this result in the case of the stomach and spleen meridians. In Figure 1A, the heat source is near the left leg of the patient. As a result, the structure of the left stomach meridian and the right spleen meridian is revealed. After changing sides, the mirror meridian images are revealed. These results can be consistently reproduced.

RESULTS AND DISCUSSION

Figure 2 shows evidence that what can be seen along the stomach meridian can be documented over its entire length. Figure 3 displays the same for the bladder meridian after

International Institute of Biophysics, Landesstiftung Hombroich, Neuss, Germany.

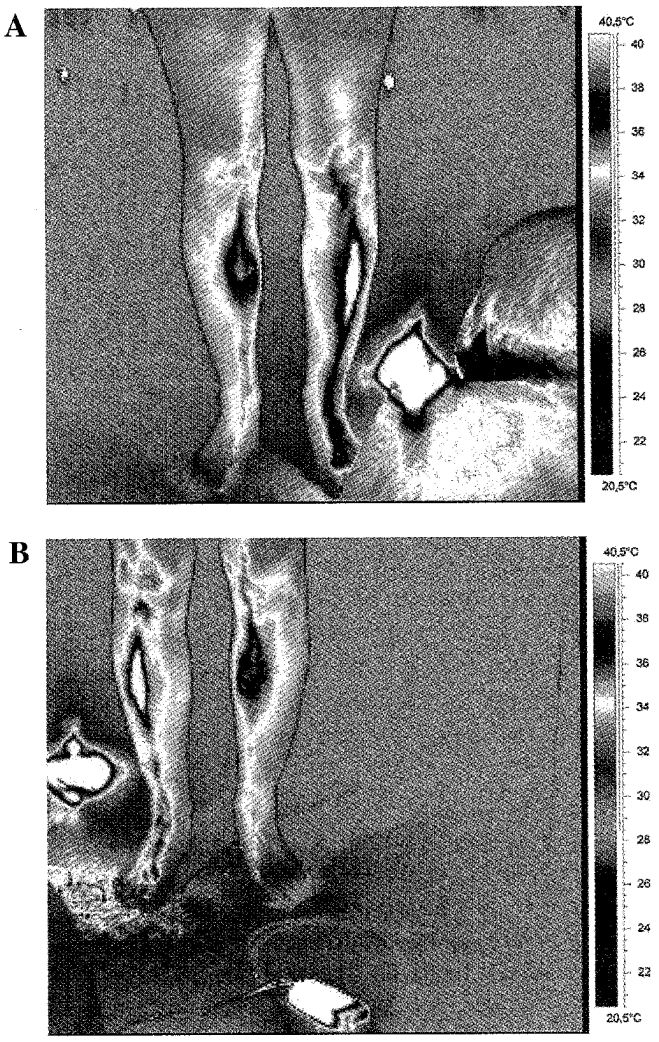

FIG. 1. Meridian structure revealed after burning moxibustion cigar. A. Heat source near patient's left leg. B. Changing sides reveals mirror meridian images.

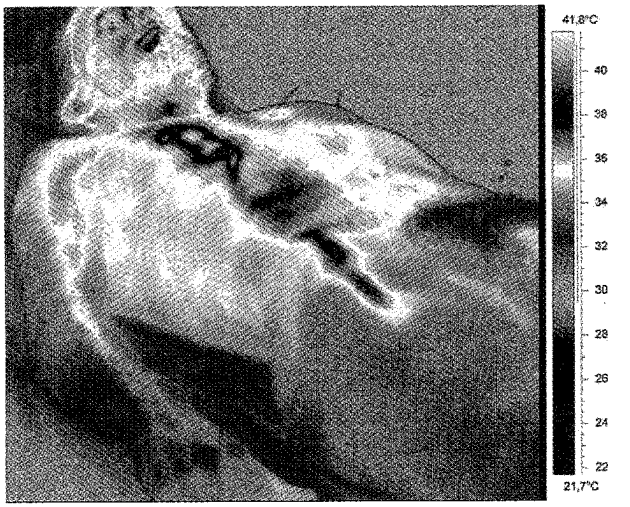

FIG. 2. Structure along stomach meridian after moxibustion.

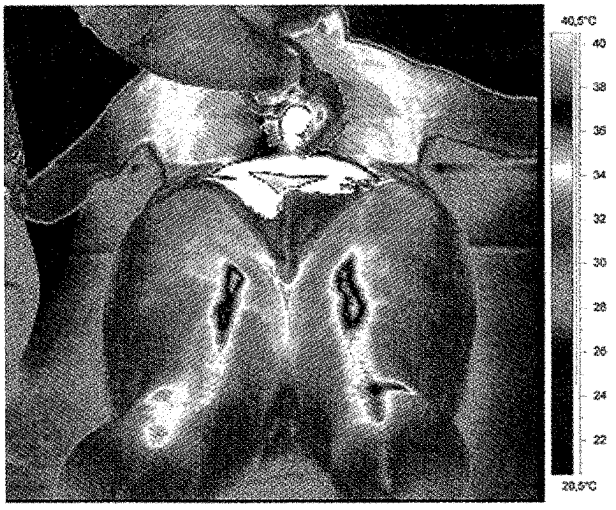

FIG. 3. Structure along bladder meridian after moxibustion.

moxibustion near the shoulder blade. These results were compatible with the clinical symptoms. The meridians revealed in this study showed an impressive agreement with images of the known traditional pictures of the meridians. All meridians can be revealed in this way.

Distinct temperature gradients of $\sim 5°C/cm^2$ can be fixed and established within these wave guides, as long as the heat source remains present. After withdrawing moxibustion, the patterns disappear within ~ 1 second.

There are attempts underway to explain these phenomena in terms of the rather general differential equation of R.N. Thomas (1961) and F.A. Popp (1979) for the interaction of radiation with matter, in particular in living tissues:

$$di_\lambda/d\tau_\lambda = i_\lambda - s_\lambda$$

where i_λ is a measure of the observed spectral radiation intensity, τ_λ is the optical thickness as a measure of the difference between the number of the contributing excited and unexcited molecules, and s_λ is a measure of the equilibrium spectral intensity of the tissue under investigation (i.e., heat radiation). It is worthwhile to note that one of the solutions of the equation describes just the phenomenon that is observed, that is, a Gaussian distribution:

$$i_\lambda = s_\lambda \exp(-<\mathbf{bd}>^2)$$

where **b** is a vector perpendicular to the direction of propagation (perpendicular to the direction of the meridian), while the absolute value b is a parameter that has to be adjusted to the boundary conditions, and **d** is a vector from the center of the meridian to the point under investigation. These solutions represent well-known optical solitons. In the direction of propagation the meridians are the lines of $i_\lambda = s_\lambda$. Perpendicular to this direction, $<\mathbf{bd}>^2$ takes its

highest possible value, and the radiating pattern displays its highest gradient.

Similar observations of meridians in the infrared range are known from Hu (1996) and, in the case of plant tissues, from Mandoli and Briggs (1982).

ACKNOWLEDGMENTS

The authors thank Prof. Dr. W. Klimek, Ministery of Research BMFB, Germany, and Prof. Dr. Hans-Peter Dürr, Max-Planck-Institute, Heisenberg Institute of Theoretical Physics, Munich, for their encouraging discussions and valuable advice in the correct interpretation of this exciting phenomenon.

REFERENCES

Hu X, Wang P, Wu B, Xu J. Displaying the meridian courses over human body surface with thermal imaging system. Rev Paul Acupunct 1996;2:7–12.

Li D. The Jingluo Phenomenon. Japan: Yukonsha Publishing, 1984.

Mandoli DF, Briggs WR. Optical properties of etiolated plant tissues. Proc Natl Acad Sci U S A 1982;79:2902–2906.

Popp FA. Photon Storage in Biological Systems. In: Popp FA, Becker G, König HL, Peschka W (eds.) Electromagnetic Bio-Information. München-Wien-Baltimore: Urban & Schwarzenberg; 1979:123–149.

Thomas RN. Some Aspects of Non-Equilibrium Thermodynamics in the Presence of a Radiation Field. Boulder: Boulder, Colorado, 1961.

Wolfson V. The puzzle of acupuncture. Am J Chin Med 2003;31:983–990.

Address reprint requests to:
Fritz-Albert Popp, Ph.D.
International Institute of Biophysics
Landesstiftung Hombroich
Kapellener Straße o.N.
41472 Neuss
Germany

E-mail: iib@lifescientists.de