

Infrared Imaging

Yin Lo, PhD

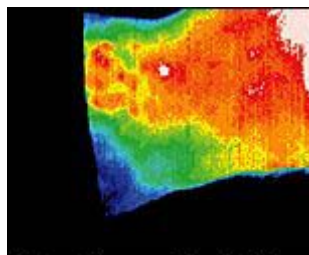
How Does Moxibustion Work Scientifically?

Moxibustion and acupuncture have always gone together as one compound name in the Chinese classics on treatment of illness. We have explained in previous articles in *Acupuncture Today* how acupuncture works in terms of modern science. How does moxibustion work in terms of modern science? The simple answer is that meridians are like optical fibers that transmit infrared radiation.

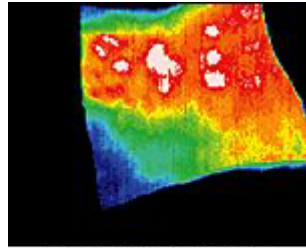
Fudan University conducted an experiment on meridians and found the following: A high transparency (76 percent) at a wavelength of 2.66 microns has been measured along the axis direction of the collagenous fiber at the Gallbladder meridian on one lower limb in a human body. Along the fiber axis of the Stomach meridian, the transparency is 62 percent at wavelengths of 9-20 microns. The transparency vertical to the axis is 0.4 percent. There is a difference in transparency of more than 240 times between infrared light along the axis and infrared light vertical to the axis of the meridians.

The most interesting thing I have found out on moxibustion is that although it uses heat, it cools down the problem area, so the healing mechanism of moxibustion is the same as needle acupuncture. It is through *qi* that moxibustion does the work, not the direct incoherent heat that we associate with burning.

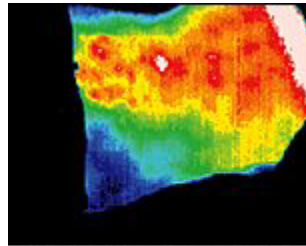
Moxibustion can also lower hot spots in painful areas. Please see the following infrared pictures. The color code for the images is as follows: the highest temperature is in white, followed by red, yellow, green, blue, and black.



Infrared image of back, before treatment.



Infrared image of back, immediately after moxibustion at BL 23, BL 25, BL 18, DU 3 and DU 4. The back warms up as shown.



Two minutes after treatment, the heat due to the warming effect of moxibustion has gone and the back starts to cool off.

The validity of moxibustion has been confirmed by many recent scientific studies.* It has effects on the immune system, analgesia, the kidneys, colitis, ulcers, neurons, and gene expression. Let us briefly describe them.

The Immune System

Moxibustion at acupoints *qi hai* (Ren 6) and *tian shu* (ST 25) inhibited the expression of IL-1 (beta) and IL-6 mRNA in experiments on rats with ulcerative colitis.

A. Moxibustion at acupoint *guan yuan* (Ren 4) on sarcoma S180 ascitic mice increases the decreased erythrocytic C3b receptor rosette-forming rate, decreases the raised immunocomplex rosette-forming rate, and increases activity of erythrocytic immunosuppressive factor in tumor-bearing mice. Hence, moxibustion strengthens erythrocytic immunity.

B. On tumor-bearing mice, there is an instant elevation of serum ACTH and beta-EP from moxibustion at *guan yuan*.

C. Moxibustion at *guan yuan* on tumor-bearing mice promotes hyperplasia of the pituitary and adrenal glands, stimulates the secretion of beta END from the pituitary and adrenal glands, and increases the level of serum beta-END significantly.

D. In arthritic rats, moxibustion at acupoint *shen shu* (BL 23) could lighten local inflammatory reaction, eliminate swelling, prevent or reduce polyarthritises, maintain

weight and shorten the course of the disease. It could help with recovery and promote the effects of concanavalin, inducing splenic lymphocyte proliferation in rats. It could also promote interleukin-2 production, and decrease IL-1 contents.

Analgesia

A. Moxibustion-induced analgesia was studied in rats, which were urethane-anesthetized. Single-unit extracellular recordings from neurons in the trigeminal nucleus caudalis were obtained from a micropipette. Suppression was observed on both wide dynamic range and nociceptive-specific, but not on low-threshold mechanoreceptive units. Moxibustion-induced moderate suppression with a long induction time. It suggested that noxious inhibitory controls may be involved in the analgesic mechanism.

B. The analgesic effect of moxibustion was measured by the latency of tail flinch threshold (LTH) in rats. When the surface temperature was modulated within 38-39⁰ Celsius and 43-44⁰ Celsius, LTH increased 17.7 +/- 2.1 percent and 22.2 +/- 2.5 percent, respectively, after 5 minutes ($p < 0.05$).

Renal Function, Colitis, Ulcers, Neurons and Gene Expression

A. The effects of moxibustion at acupoints BL 15 and BL 27 were studied on spontaneously hypertensive rats. Urinary volume was increased for BL 15, but decreased for BL 27. Urinary secretion of Na⁺ was decreased for BL 15 and BL 27. Systolic blood pressure was decreased for BL 15, but not for BL 27. Plasma levels of aldosterone and renin activity were increased, and atrial natriuretic peptide was decreased for BL 15. Plasma levels of aldosterone and atrial natriuretic peptide were increased for BL 27.

B. The effect of moxibustion at acupoint Ren 4 on the function of MDR gene product P-glycoprotein P-170 in mice with S-180R adriamycin-resistant tumor cells was studied. A weak inhibition was found when moxibustion was performed at Ren 4 alone, and a very significant inhibition was observed in the presence of low dosage of verapamil, but not at high dosage.

C. Moxibustion at *shen shu* on experimentally induced gastric ulcerated rats was found to reduce the ulcer area significantly ($p < 0.05$), and increase the zinc content in serum significantly. Pre-treatment by moxibustion had a protective effect on the gastric mucosa.

D. Stimulating acupoint *zu san li* (ST 36) on rats with a moxa stick can increase the activity of cholinesterase ($p < 0.05$), and inhibit hyperactive gastrointestinal motility ($p < 0.05$).

E. The effect of moxibustion on primary sensory neurons in the skin of rats was studied with immunocytochemistry combined with a fluorescent retrograde tracer dye. Moxibustion was found to induce galanin expression by primary sensory neurons containing substance P.

F. Pre-treatment with moxibustion at BL 23 significantly prevented the formation of gastric ulcer in rats.

It is quite clear from the above studies that the heat, or infrared radiation, from moxibustion preferentially transmits through meridians from acupoints to internal organs. Meridians act like a light pipe. This is consistent with our hypothesis that meridians are made up of water clusters.

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* For details on scientific references, please consult *Biophysics Basis for Acupuncture and Health* (Dragon Eyes Press), which can be ordered online at www.booksurge.com.

Editor's note: If you would like to comment on Dr. Lo's article, please contact *Acupuncture Today* by fax (714 899-4273) or e-mail (Editorial@AcupunctureToday.com). You are also encouraged to discuss Dr. Lo's article on his "Talk Back" forum at www.AcupunctureToday.com/columnists/lo.