



Department of Mechanical Engineering
University of Hong Kong

**Workshop on Application and Productization Design
for Far Infrared Rays (FIR) Technology
– Healthcare Products**

Effects of FIR on Health

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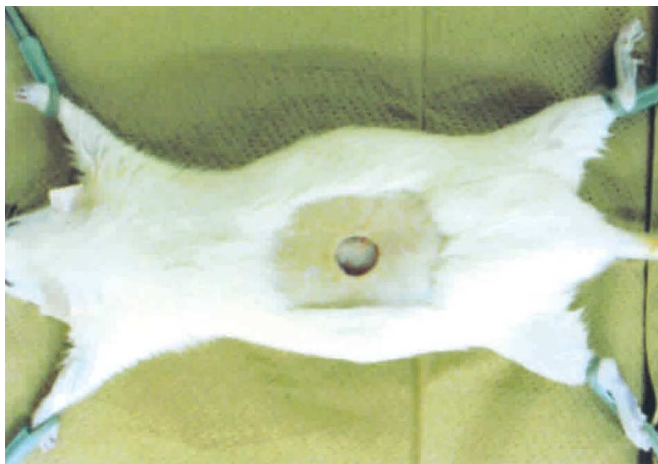
Vascular Inflammation Inhibition by Far Infrared Therapy

- ❖ Publication: Far Infrared Therapy Inhibits Vascular Endothelial Inflammation via the Induction of Heme Oxygenase-1, *Arterioscler Thromb Vasc Biol.* 2008, 28:739-745.
- ❖ The results demonstrate that FIR therapy exerts a potent anti-inflammatory effect via the induction of HO-1. The ability of FIR therapy to inhibit inflammation may play a critical role in helping hemodialysis patients.



Promotion of Skin Wound Healing by Far Infrared Rays

- ❖ Publication: Promotive Effects of Far-Infrared Ray on Full-Thickness Skin Wound Healing in Rats, *Exp Biol Med.* 2003, 228:724-729.
- ❖ Wound healing was observed to be significantly more rapid with than without FIR.





Promotion of Skin Microcirculation by Far Infrared Therapy

- ❖ Publication: Biological Effect of Far-Infrared Therapy on Increasing Skin Microcirculation in Rats, *Photodermatol Photoimmunol Photomed* 2006, 22:78-86.
- ❖ The abdominal skin temperature was found to increase steadily from 38 to 39°C when the rats were radiated with an FIR emitter at a distance of 20 cm.
- ❖ It was concluded that FIR therapy exerts a nitric oxide related biological effect to increase skin microcirculation in rats, with an indication that FIR might be used to treat ischemic disease.



Treatment of Chronic Pain by Thermal Therapy

- ❖ Publication: The Effects of Repeated Thermal Therapy for Patients with Chronic Pain, *Psychother Psychosom* 2005, 74:288-294.
- ❖ An FIR dry sauna therapy and post-sauna warming were performed once a day for 4 weeks on the patients.
- ❖ The visual pain score, number of pain behaviour, self-rated depression scale and anger score decreased significantly after treatment.



FIR Equipment in Use





FIR Equipment in Use





FIR Equipment in Use



Bed sore 1



Bed sore 2



FIR Equipment in Use





Conclusions

- ❖ Clinical studies on humans and rats indicate that FIR therapy has substantial benefits on chronic pain, skin microcirculation, wound healing and vascular inflammation.
- ❖ There is a clear need for additional studies to be conducted locally in order to support testing and certification of FIR healthcare products and to promote the development of product design for the FIR healthcare industry.



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End – Thank You