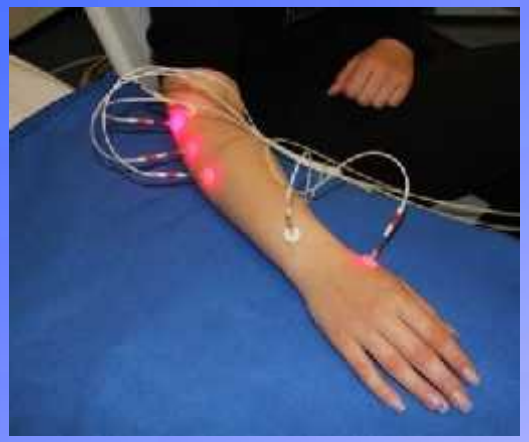
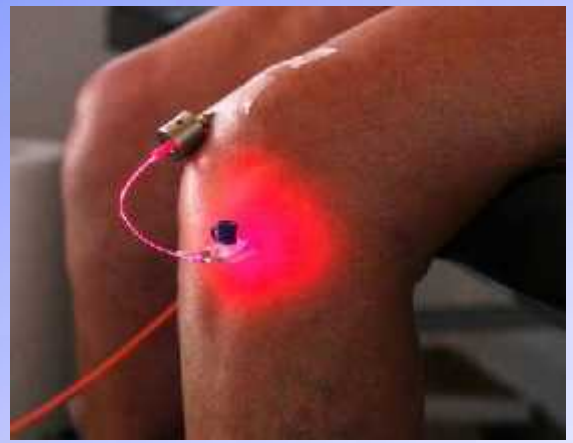
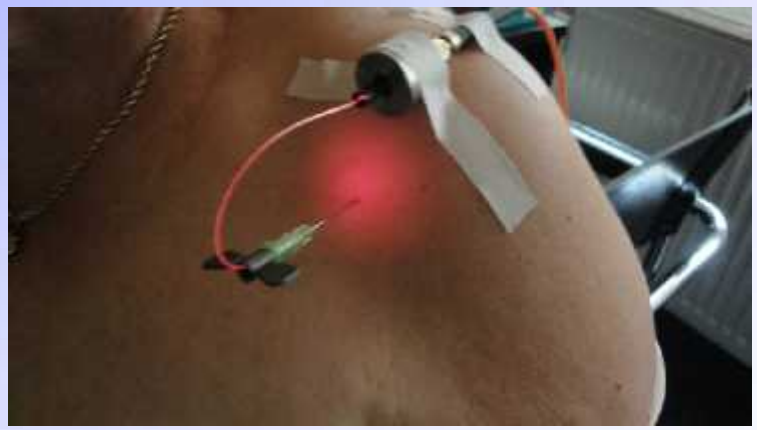
Michael H. Weber

Basics, science and clinical applications of laserneedle acupuncture







Weberinstitute for research and lasertherapy, Lauenförde & Göttingen,Germany

Topics

- Basics of laser physics and fiberoptic laser application
- Scientific data about laserneedle acupuncture
- Treament examples and protocols
- Body, ear and skull acupuncture with laserneedles
- Acupuncture effects on stem cells
- Interstitial and intraarticular laser therapy
- Laserstimulated PRP and stem cells
- Intravenous laser therapy
- Photodynamic therapy in oncology
- Wrist acupuncture with the new laser watch:

  combining wrist acupuncture with lystemic laser body energizing, metabolic improvement,immune stimulation

Dr. Michael Weber

- 1968-1974 Study and Diploma in Chemistry and Biochemistry
- 1974-1976 High school teacher
- 1976-1983 Study of medicine and MD in 1983
- 1983-1985 Research Max Planck in Göttingen
- 1985-1988 Internal medicine university Göttingen
- Since 1988 own clinic for general and internal medicine
- Since 2002 Laser therapy centers in Lauenförde and Göttingen, Germany for pain management, regenerative medicine and cancer therapy

Preliminary work in laser therapy

- Purpose of the invention in 2000 was to set up a modular new laser system for painfree therapy with multiple lasers of multiple points and areas of pain on the body simultaneously

- The system should be different from current ones which stimulate only one point or only one area and work normally with only one laser.

- Solution was a fiberoptic system for leading focussed laser beams on or in the body

Webermedical Germany

- 2003 Foundation of the new Webermedical GmbH, Germany

- Financial support for development of a new fiberoptic system with 12 channels with red and infrared laser by the Germany government and the European Union with 250 000 €

New fiberoptic laser systems

(Weberneedle Basic/Compact and Weberneedle Endolaser)

ISLA Transcontinental

- 2006 Foundation of the International Society for Medical Laser Applications

  (ISLA transcontinental)

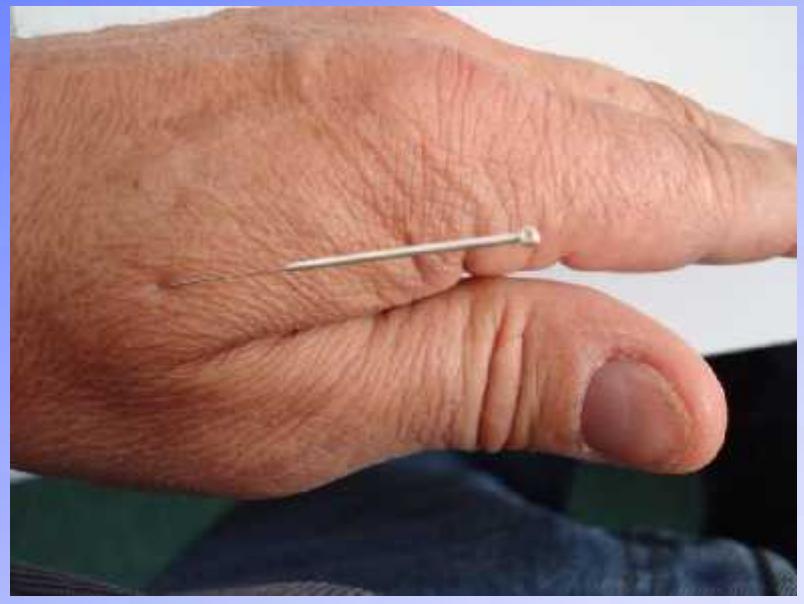
<u>Presidents</u>: Dr. M. Weber, Germany

(Clinical applications)

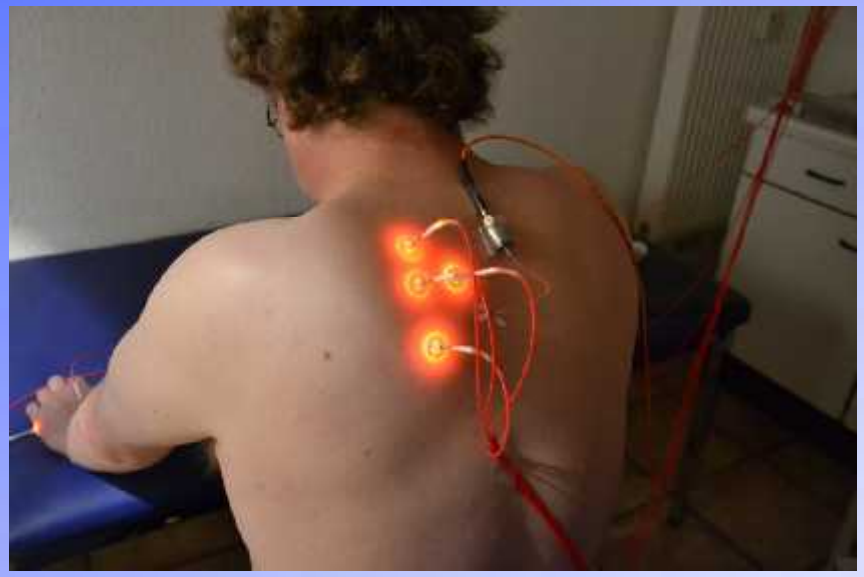
Prof. Dr. G. Litscher, Austria

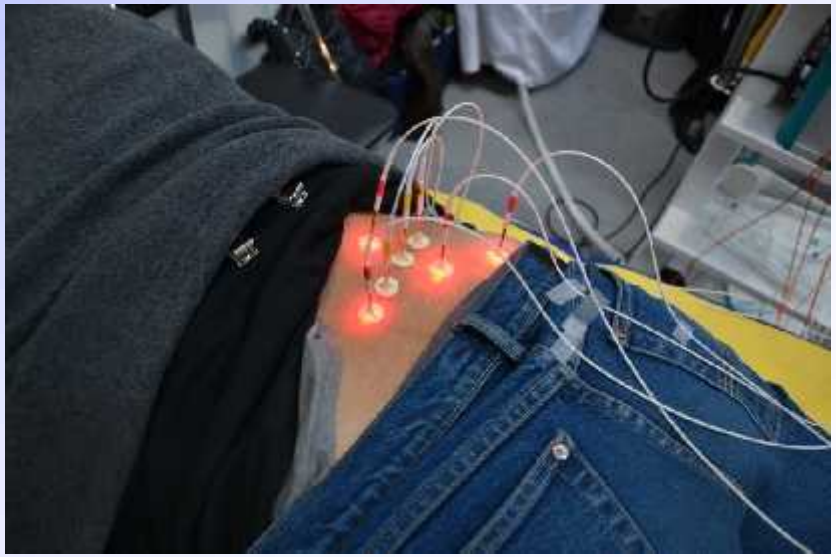
(Science)

The beginning:
Replacement of the metal needle by laserneedle für painfree acupuncture

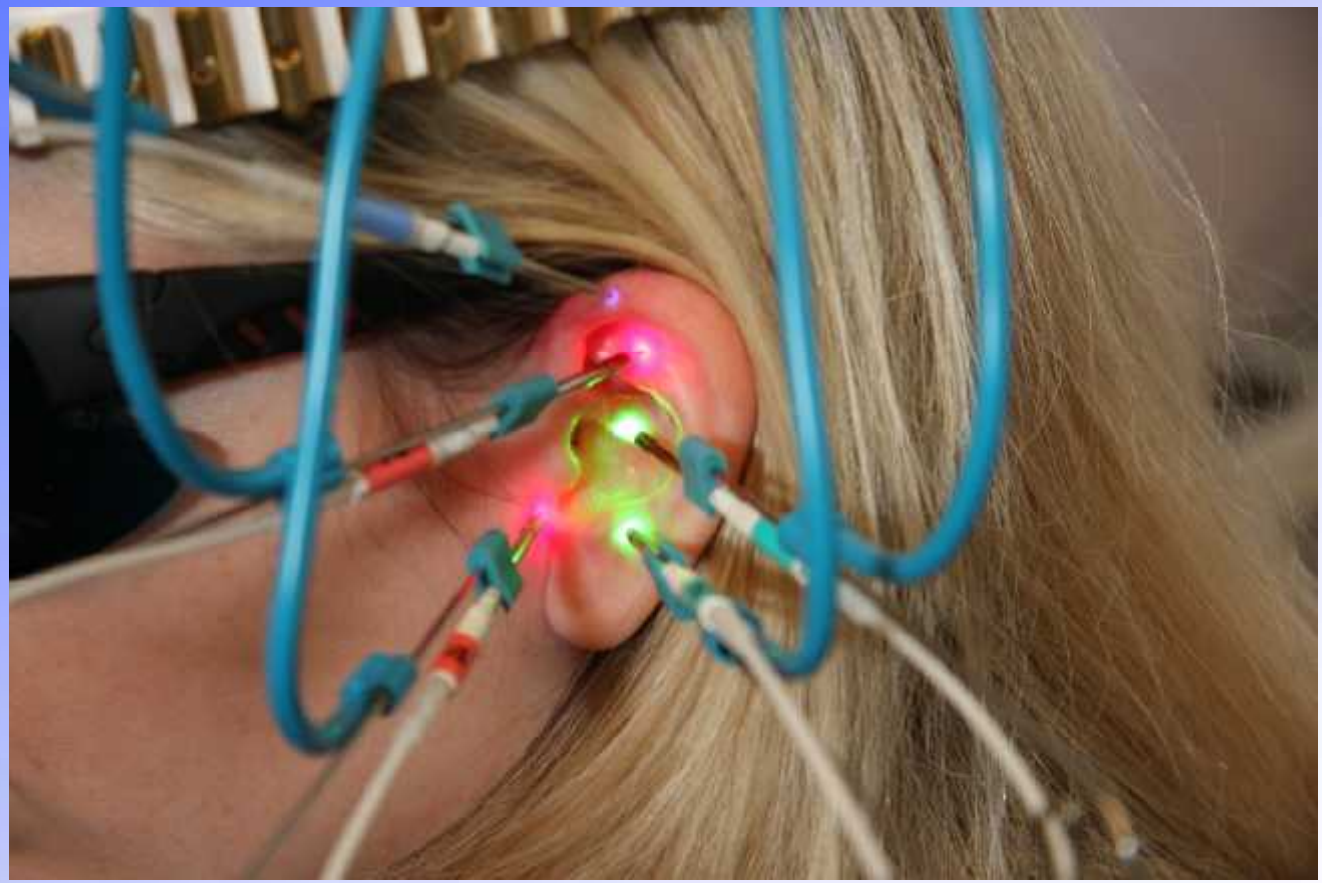


Use for acupuncture and trigger pints



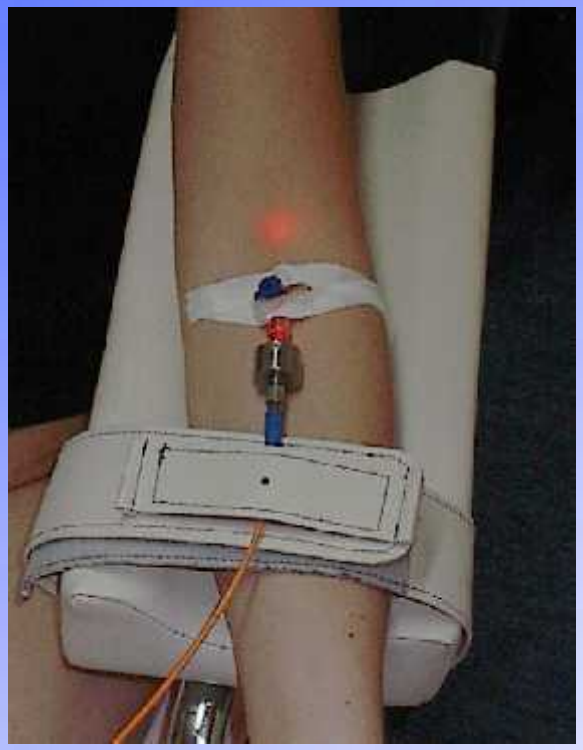


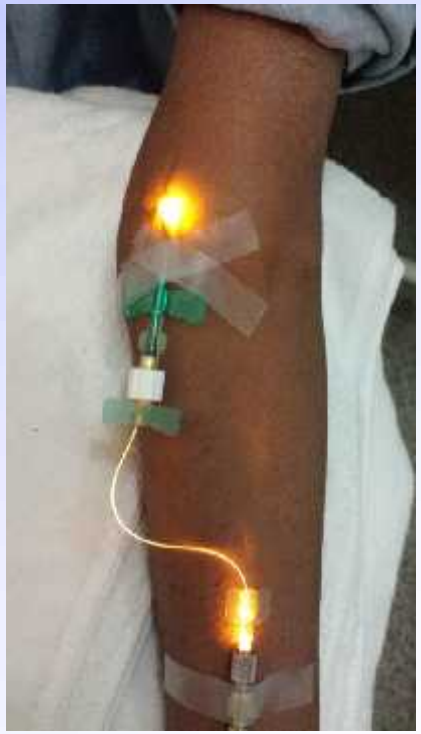
Use for ear acupuncture



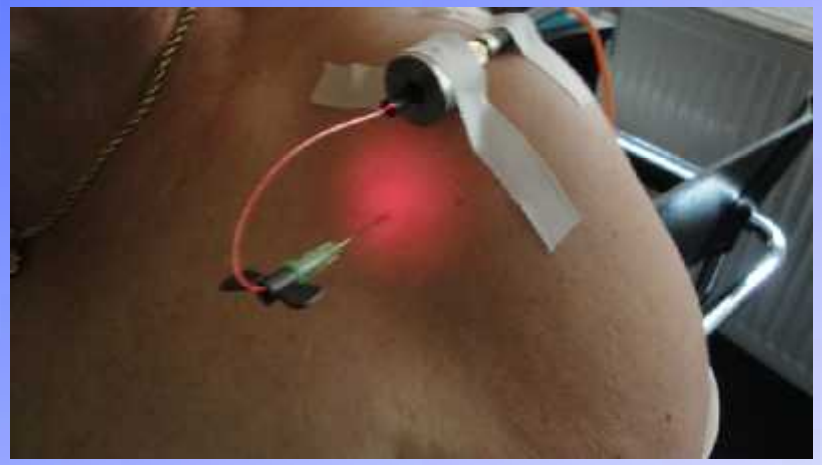
Use for skull acupuncture and transcranial laser therapy

Use for intravenous laser therapy

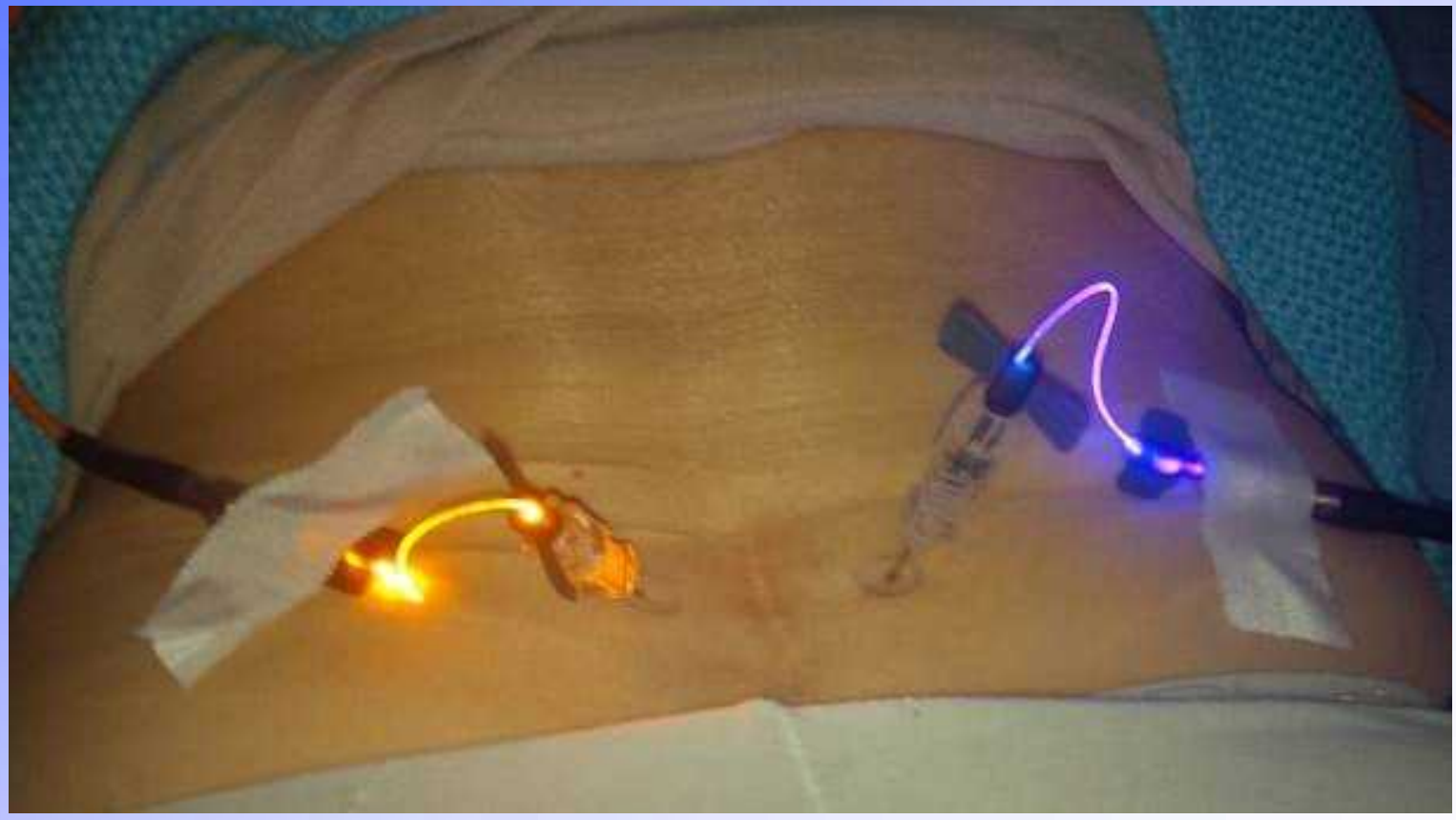




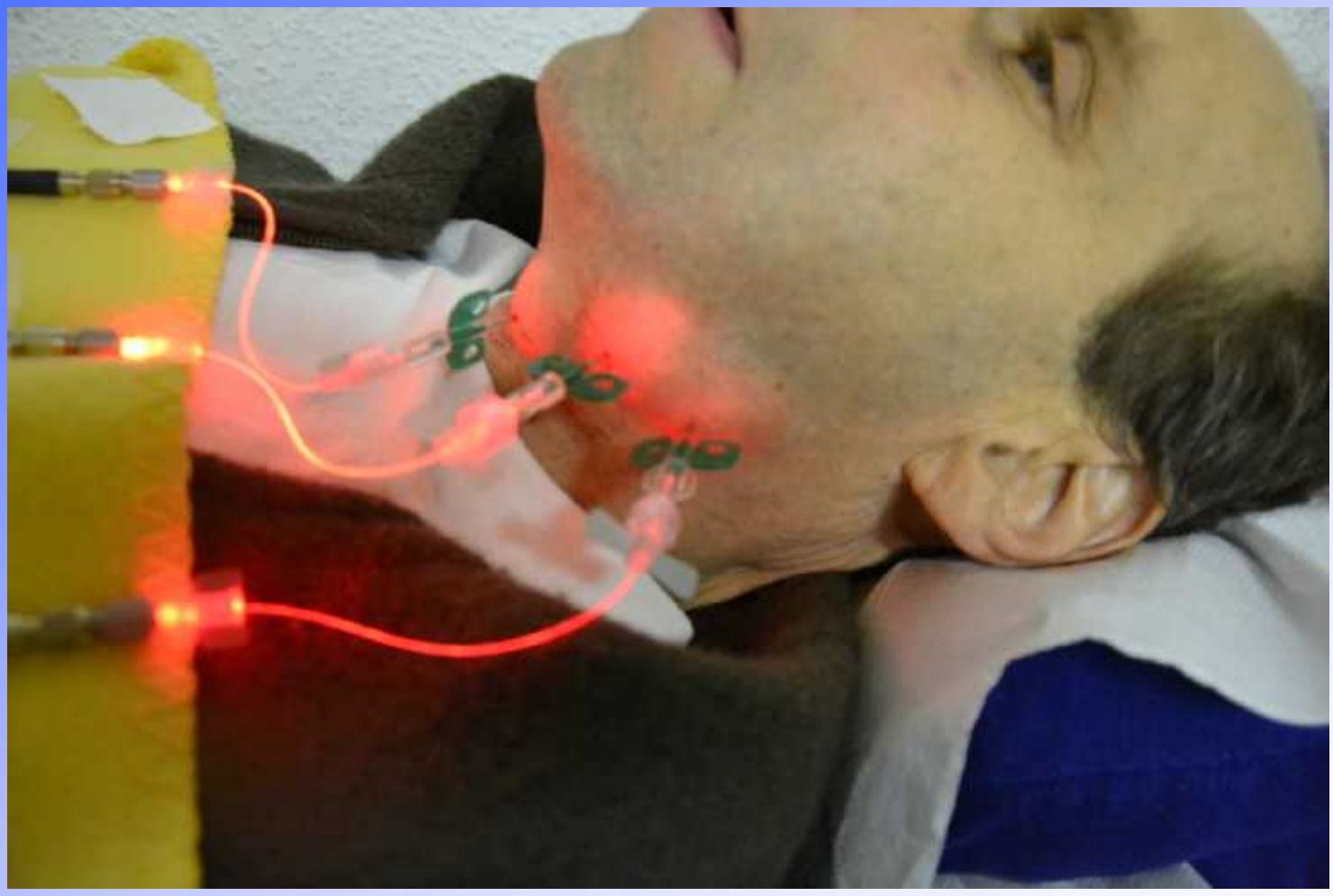
Use for interstitial and intraarticular laser therapy



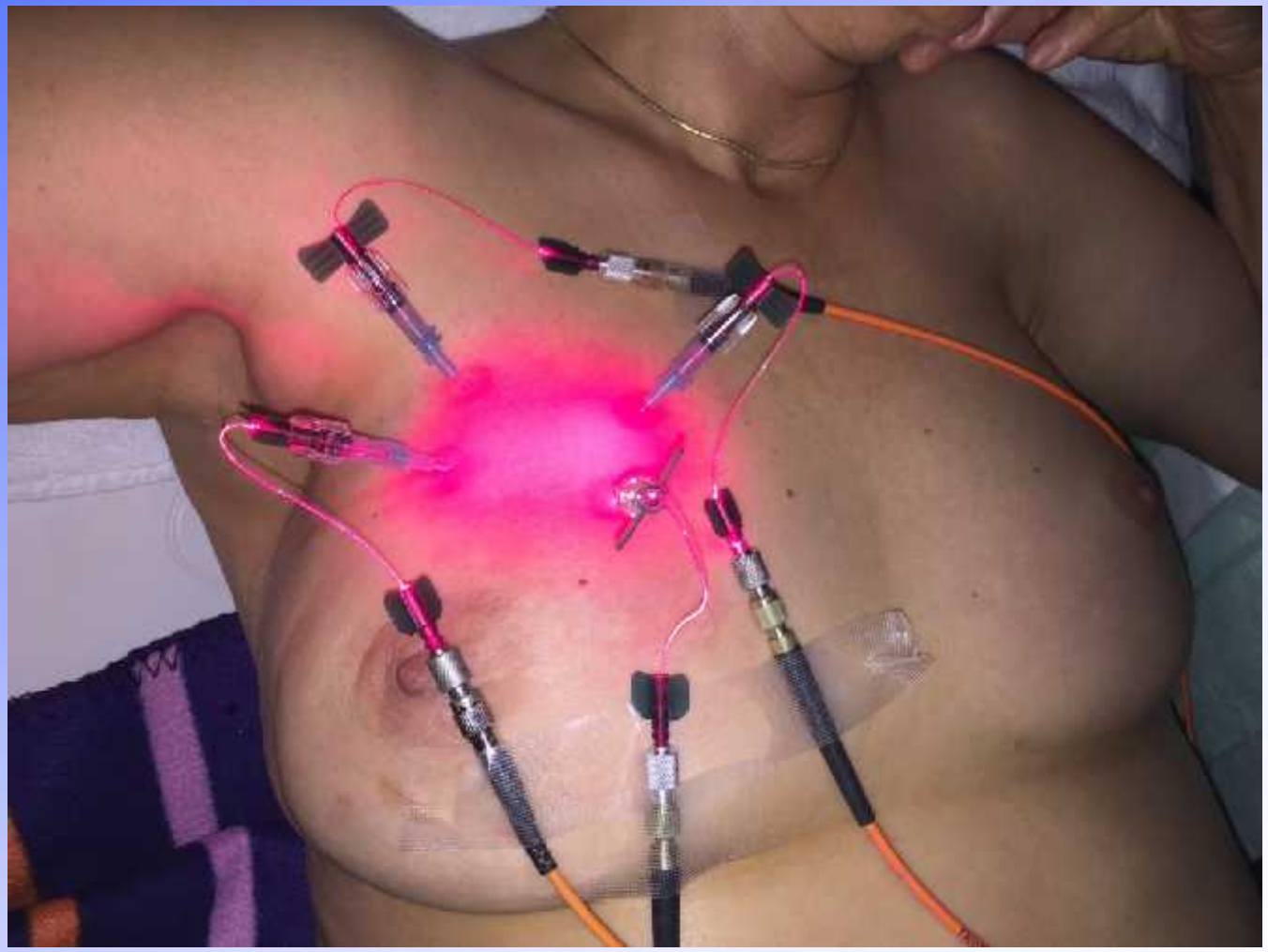
Use for interstitial spinal laser therapy



Use for interstitial photodynamic cancer therapy



Use for interstitial photodynamic cancer therapy



New Webermedical building with integrated Laser Research and Treatment Center (2013) in Lauenförde, Germany

CE-Certificate

TÜV NORD

EG-Zertifikat / *EC-Certificate*

gem. 93/42/EWG Anhang VI / *acc. 93/42/EEC Annex VI*

Reg.-Nr. / *Reg.-No.* 44 236 08 360287-001

[illegible]

weber medical GmbH

Sohnreystr. 6

37697 Lauenförde

Deutschland

[illegible]

Lasernadelakupunktur, Epikutane und transkutane Lasertherapie

Laser needle acupuncture, epicutaneous and transcutaneous laser therapy

[illegible]

[illegible]

TÜV NORD CERT GmbH, Langemarckstr. 20, D-45141 Essen

[illegible]

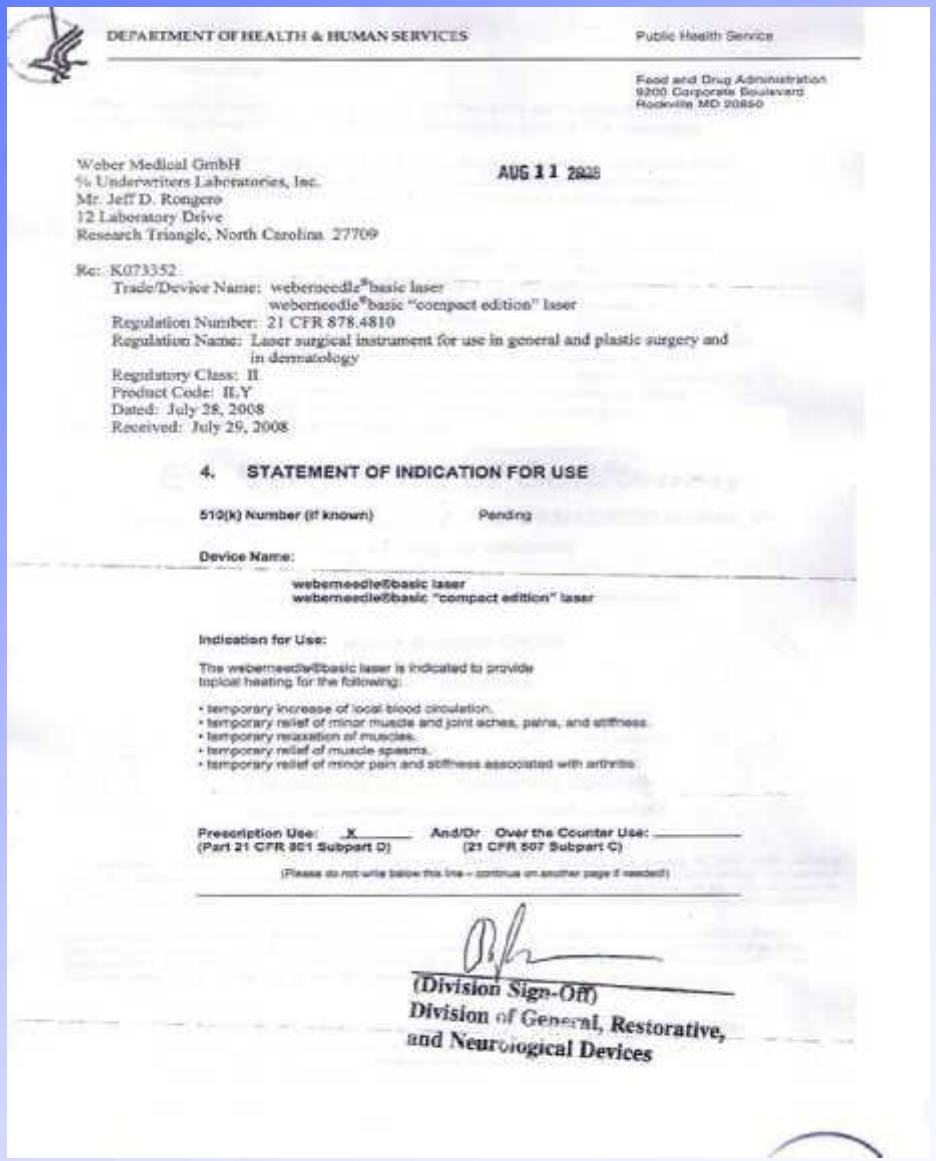
Benannte Stelle Kenn-Nr. 0044

Notified Body ID. No. 0044

Aktenzeichen *File reference* 2.4-1158/06	Ausstellungsdatum *Date of issue* 2012-01-25 / ed. 2	Bericht Nr. *Report No.* 1123539001[illegible]
Benannt durch / *Notified by* Anerkannt durch / *Recognized by* ZLG, ZLS: www.zlg.de	Gültigkeit / Validity vom / *from* 2011-07-15 bis / *until* 2014-07-14	Michael Hartwig Zertifizierungsstelle für Medizinprodukte *Certification body for medical devices*

[illegible]

FDA Certificate, USA, 2007



DEPARTMENT OF HEALTH & HUMAN SERVICES — Public Health Service

Food and Drug Administration
9200 Corporate Boulevard
Rockville MD 20850

Weber Medical GmbH
% Underwriters Laboratories, Inc.
Mr. Jeff D. Rongero
12 Laboratory Drive
Research Triangle, North Carolina 27709

AUG 11 2008

Re: K073352
Trade/Device Name: weberneedle® basic laser
weberneedle® basic "compact edition" laser
Regulation Number: 21 CFR 878.4810
Regulation Name: Laser surgical instrument for use in general and plastic surgery and in dermatology
Regulatory Class: II
Product Code: ILY
Dated: July 28, 2008
Received: July 29, 2008

4. STATEMENT OF INDICATION FOR USE

510(k) Number (if known) Pending

Device Name:

weberneedle® basic laser
weberneedle® basic "compact edition" laser

Indication for Use:

The weberneedle® basic laser is indicated to provide topical heating for the following:

- temporary increase of local blood circulation.
- temporary relief of minor muscle and joint aches, pains, and stiffness.
- temporary relaxation of muscles.
- temporary relief of muscle spasms.
- temporary relief of minor pain and stiffness associated with arthritis.

Prescription Use: X **And/Or Over the Counter Use:** _____
(Part 21 CFR 801 Subpart D) (21 CFR 807 Subpart C)

(Please do not write below this line – continue on another page if needed)

(Division Sign-Off)
Division of General, Restorative, and Neurological Devices

Certificate Health Canada 2013

Santé Canada
Health Canada

LMNH 91513

Therapeutic Products Directorate
Medical Devices Bureau
Direction des produits thérapeutiques
Bureau des matériels médicaux

Medical Device Licence / **Homologation d'un instrument médical**

Licence Number: 91513
First Issue Date: JUN 2 0 2013

No d'homologation:
Première date de délivrance:

Device Class/Classe de l'instrument: 3

This Licence is issued in accordance with the Medical Devices Regulations, Section 36, for the following medical device:

La présente homologation est délivrée en vertu de l'article 36 du Règlement sur les instruments médicaux pour l'instrument médical suivant:

Licence Name/Nom de l'homologation:
WEBER EDGE LASER SYSTEM

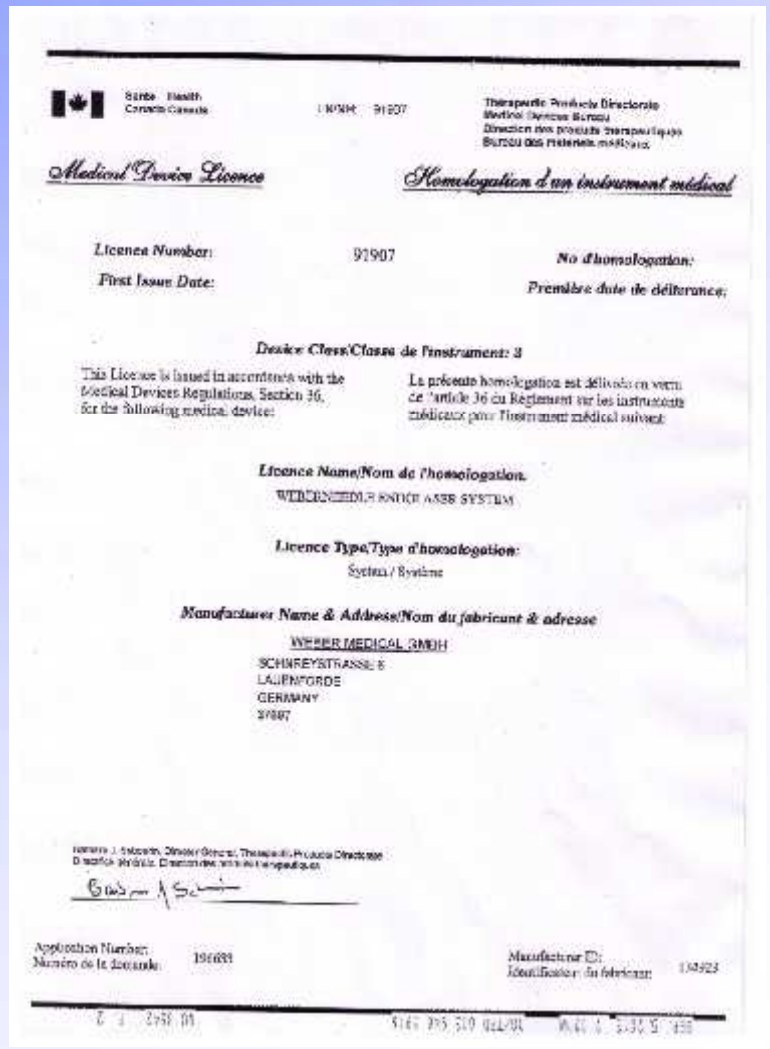
Licence Type/Type d'homologation:
System / Système

Manufacturer Name & Address/Nom du fabricant & adresse
WEBER MEDICAL GMBH
SCHREYSTRASSE 6
LAUENFORDE
GERMANY
27687

Barbara J. Sibbald, Director General, Therapeutic Products Directorate
Directrice générale, Direction des produits thérapeutiques

Application Number:
Numéro de la demande: 156634

Manufacturer ID:
Identificateur du fabricant: 134923



Santé Canada
Health Canada

LMNH 91907

Therapeutic Products Directorate
Medical Devices Bureau
Direction des produits thérapeutiques
Bureau des matériels médicaux

Medical Device Licence / **Homologation d'un instrument médical**

Licence Number: 91907
First Issue Date:

No d'homologation:
Première date de délivrance:

Device Class/Classe de l'instrument: 3

This Licence is issued in accordance with the Medical Devices Regulations, Section 36, for the following medical device:

La présente homologation est délivrée en vertu de l'article 36 du Règlement sur les instruments médicaux pour l'instrument médical suivant:

Licence Name/Nom de l'homologation:
WEBER EDGE FOTIDE ASSB SYSTEM

Licence Type/Type d'homologation:
System / Système

Manufacturer Name & Address/Nom du fabricant & adresse
WEBER MEDICAL GMBH
SCHREYSTRASSE 6
LAUENFORDE
GERMANY
27687

Barbara J. Sibbald, Director General, Therapeutic Products Directorate
Directrice générale, Direction des produits thérapeutiques

Application Number:
Numéro de la demande: 196689

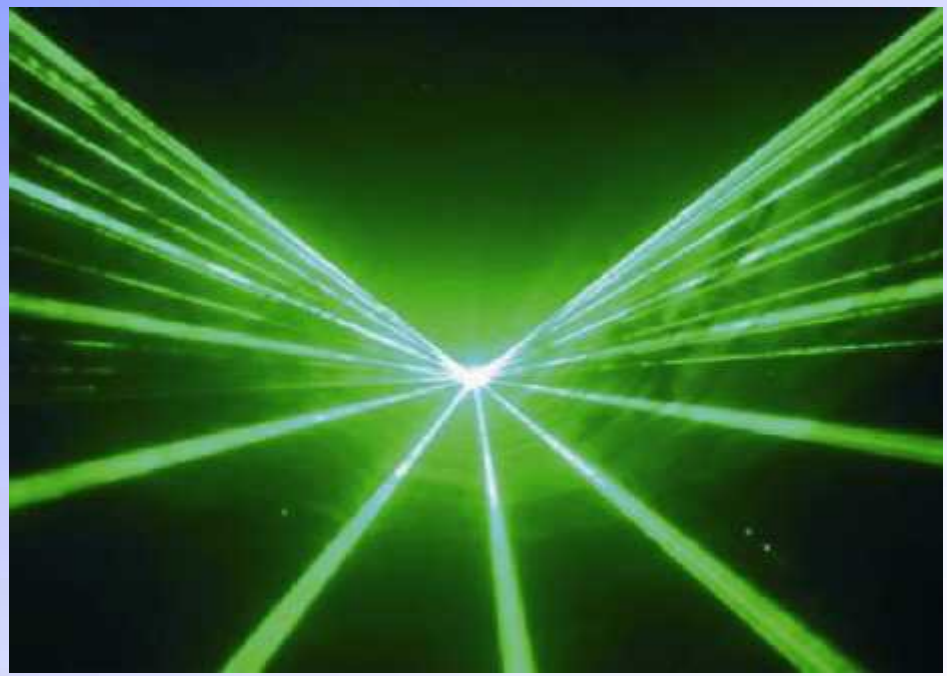
Manufacturer ID:
Identificateur du fabricant: 134923

Certificate Australia 10/2016

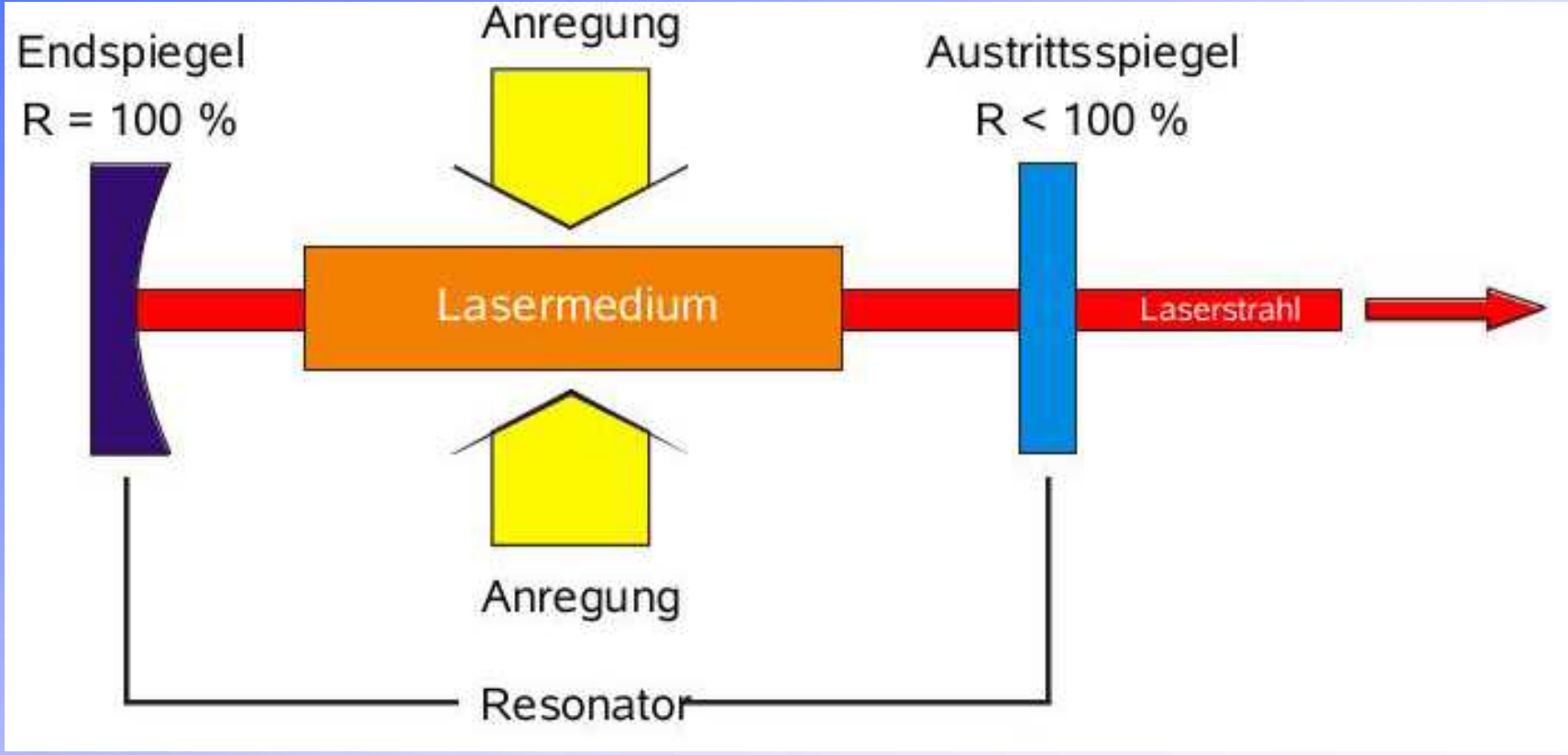
- ARTG No: 281755
- Product Name: General therapeutic low-intensity laser, line-powered
- Sponsor Name: Emergo Asia Pacific Pty Ltd T/a Emergo Australia
- Sponsor's own reference: Weber Medical GmbH_60409_Class IIa
- Entry Type: Included
- Date of Entry: 26/10/2016

LASER

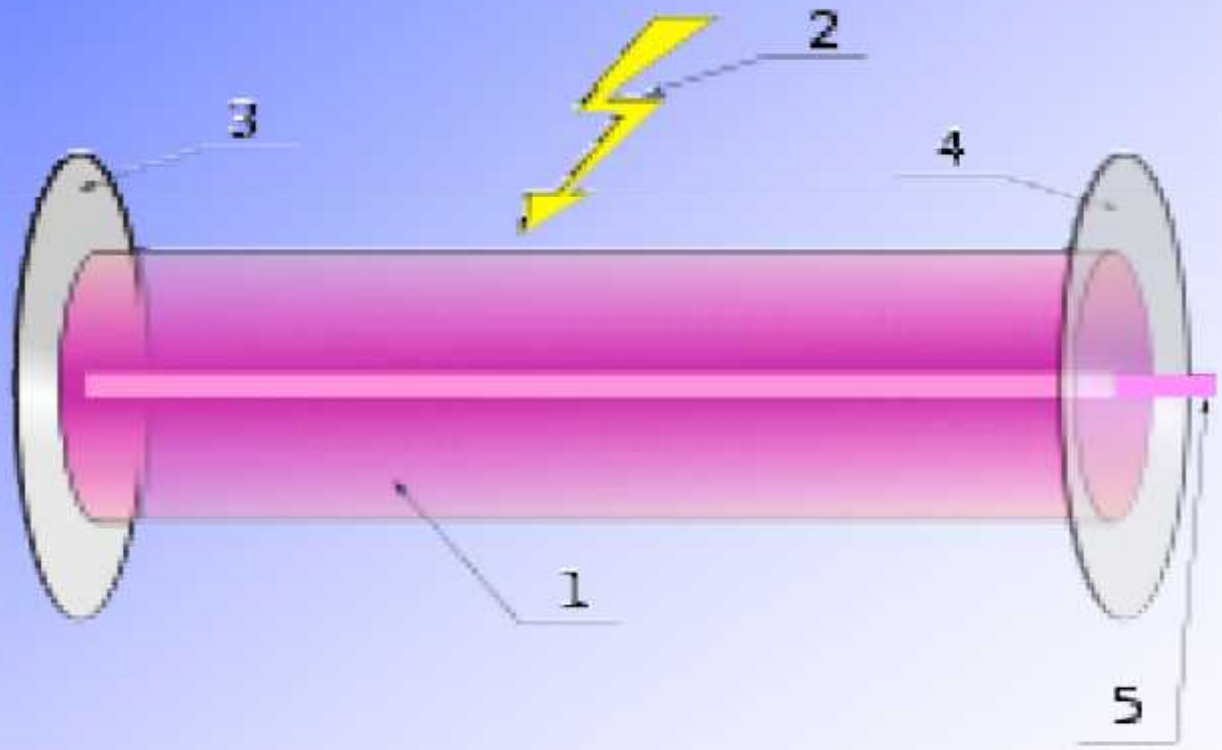
Light Amplification of Stimulated Emission of Radiation



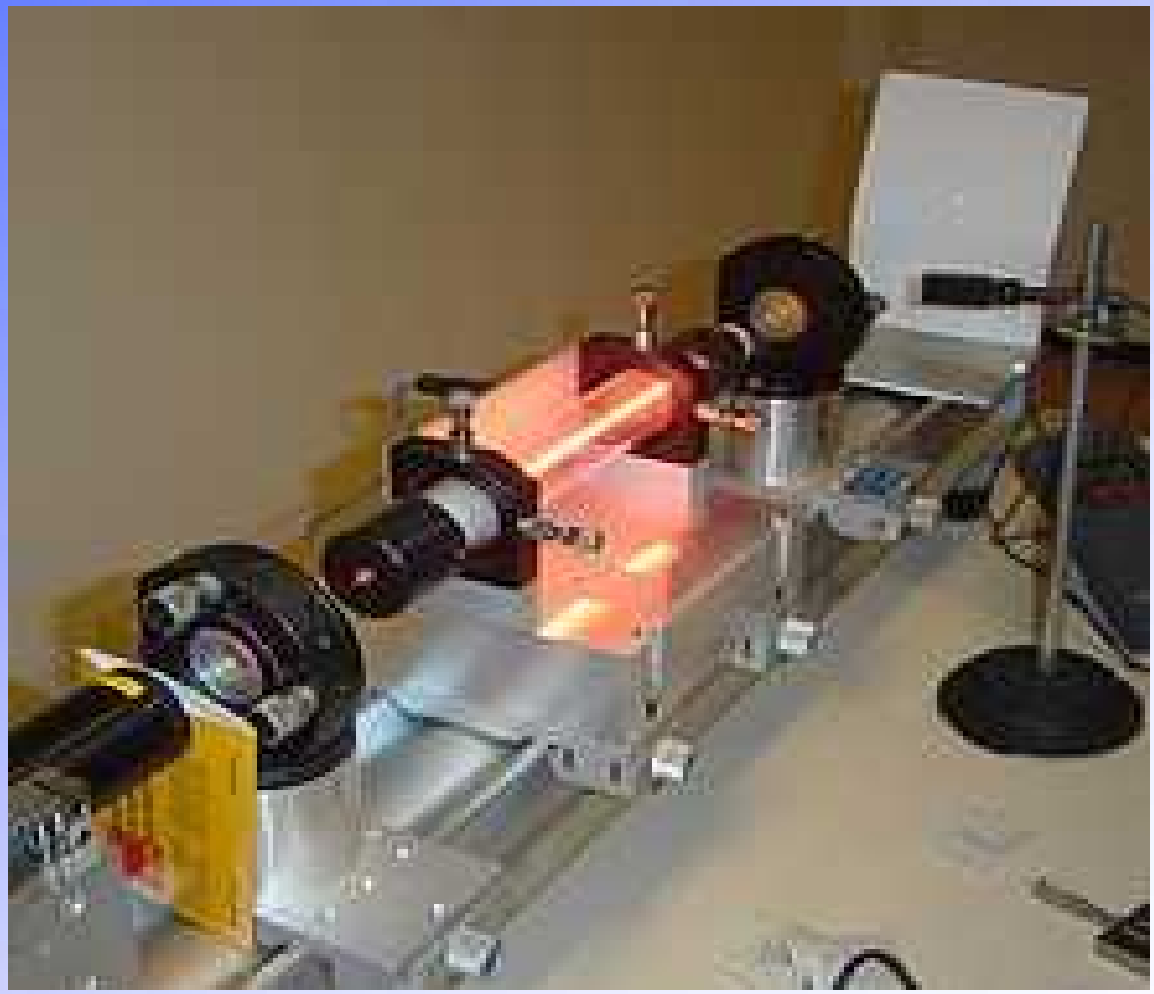
Principle of Lasers



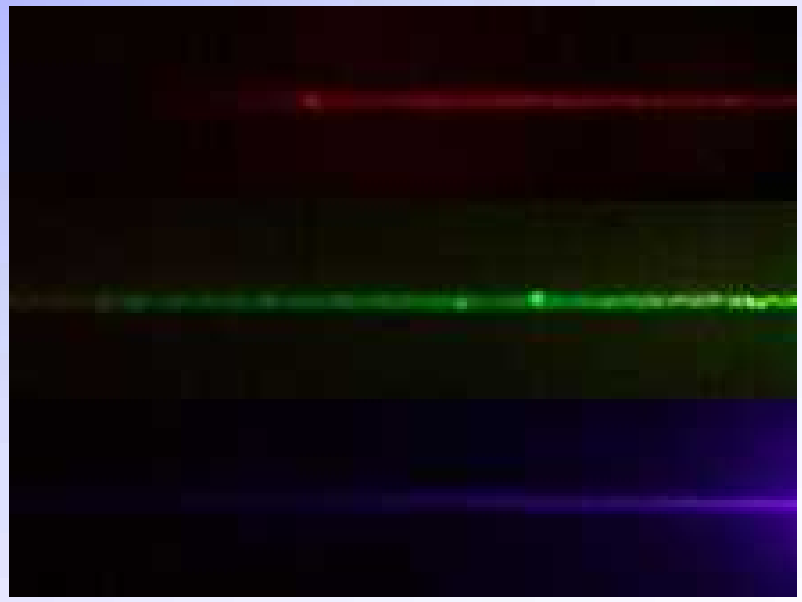
Gas laser



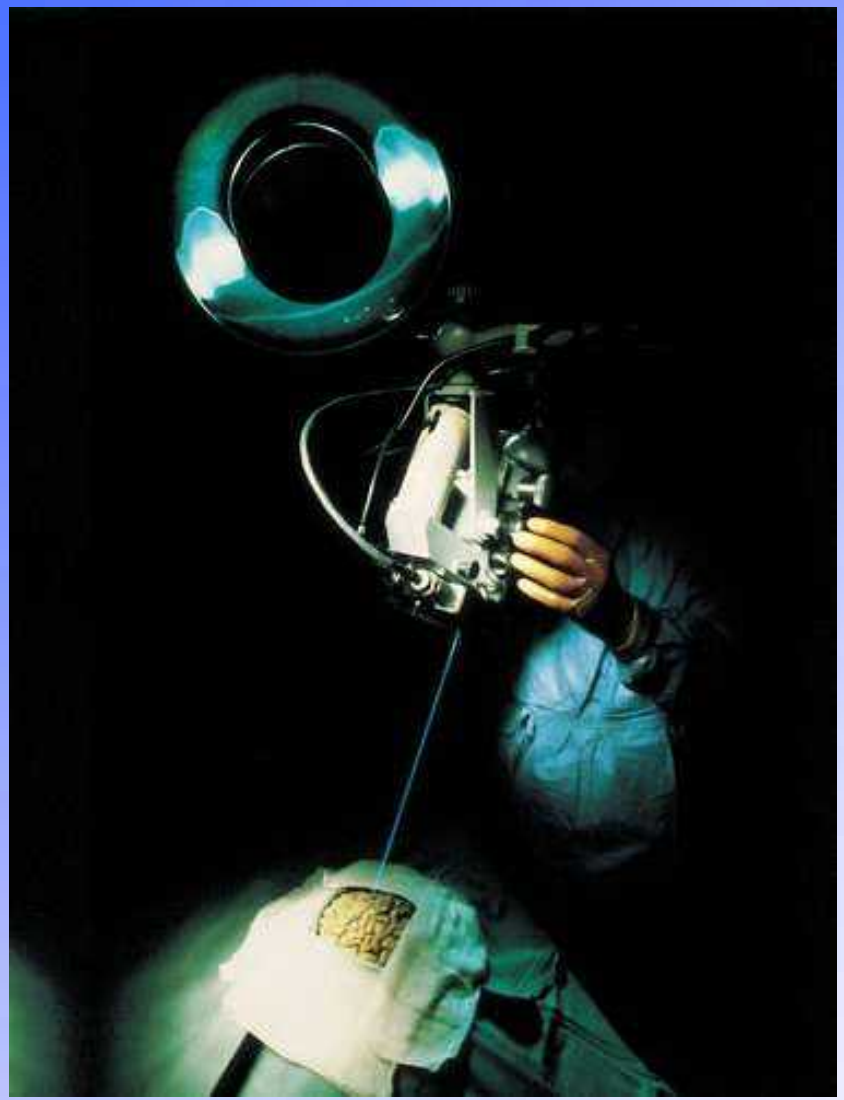
Gas laser



Diode laser



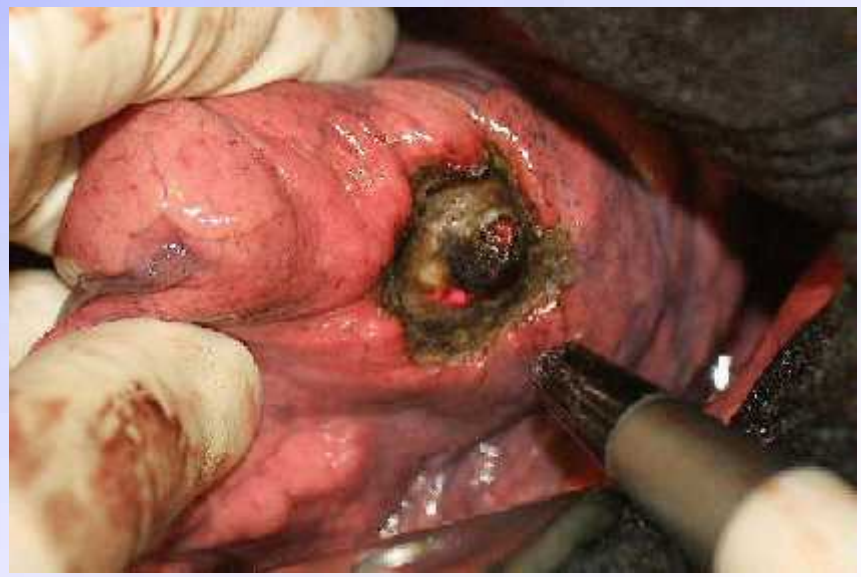
Hard lasers



Hard lasers , more than 500 mW, class IV

are rich in energy, the radiation has direct physical effects,
example heating and coagulation. (Surgery laser).

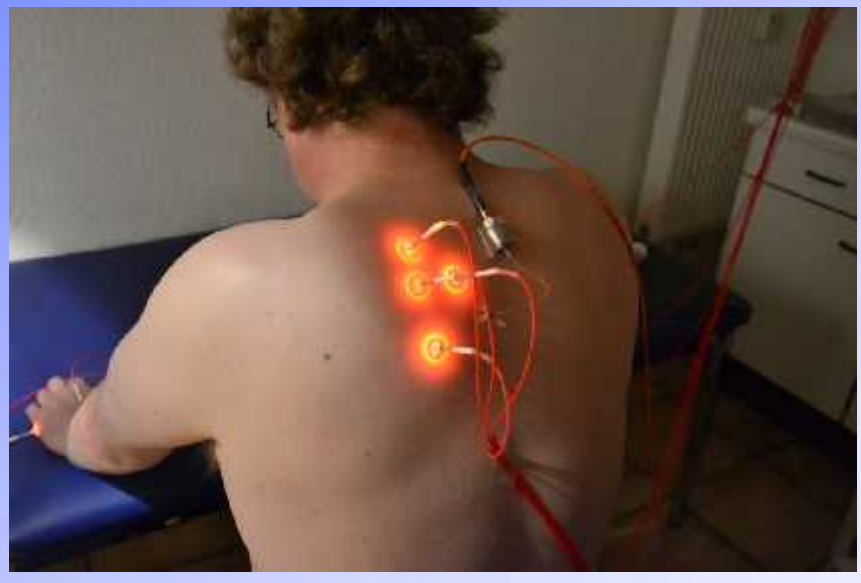
Hard (surgical) lasers class IV
more than 500 mW

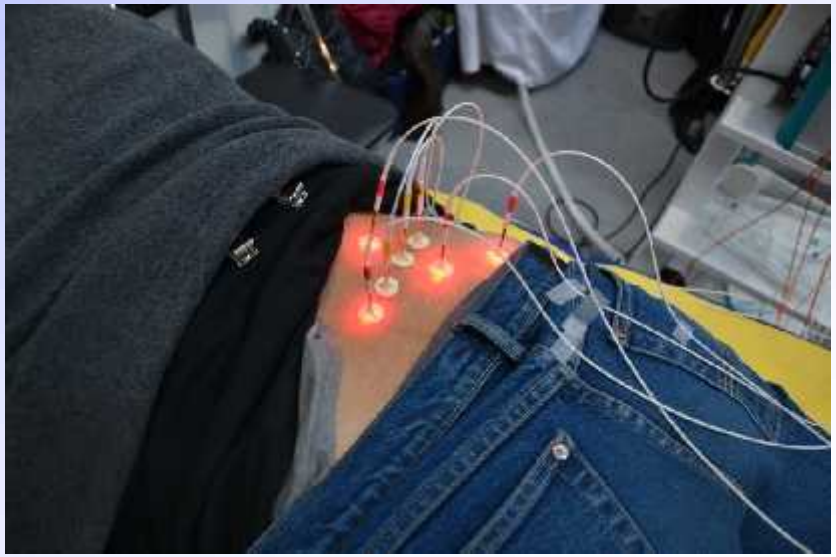


Low intensity (soft) lasers

Low intensity lasers, less than 500 mW, class III

work gently and without destruction of the tissue

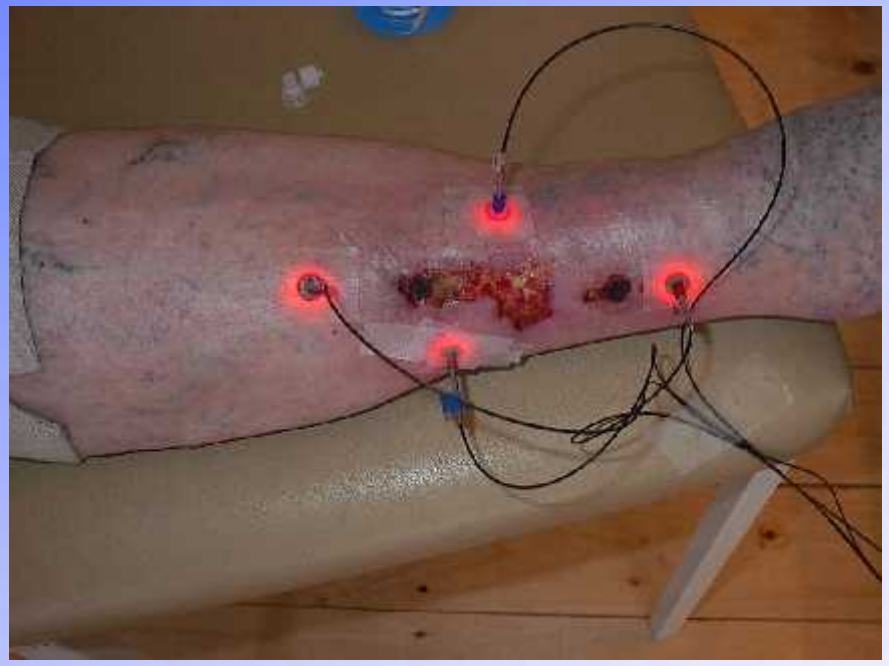




Low intensity (Soft) lasers

Soft lasers, less than 500 mW, class III

work gently and without destruction of the tissue

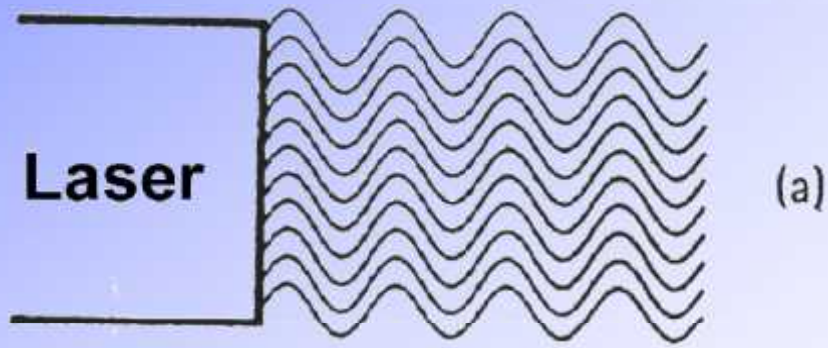


Difference between normal and laser light

(Monochromasy and coherency)

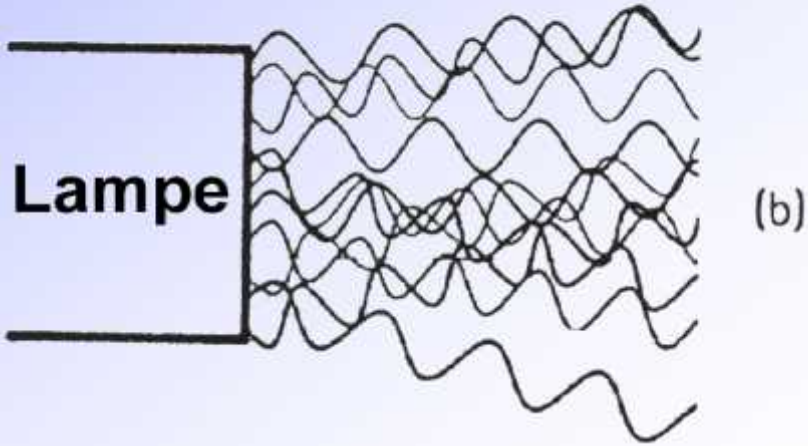
Laserlight

has a precise colour (Monochromasy) and is chracterized by an arranged photon stream (Coherence)



Conventional white light (bulb)

is a mixture of all colours, spreads in all directions



A number of very important terms used in laser physics

wavelength	Nm
frequency	Hz (waves/second)
power output	W or mW
energy	J (joules)
output intensity	W/cm^2
exposure energy	J/cm^2

Power and Energy

- Power in Watt (W) or Milliwatt (mW)
- Energy in Joule (J) or Millijoule (mJ)

- Example: Laser irradiation with 5 mW
  in1second = application of 5 mJ,
  in 10 seconds = application of 50 mJ.

- **Energy = Power x Time**

Power- and Energy density

- Power density = Watt/qcm
- Energy density = Joule/qcm

- Example

Irradiation of an area with 1 qcm with a 20 mW Laser = 20 mW/qcm.

Irradiation of an area with 1 qmm with a 20 mW Laser = 2000 mW (2W)/qcm.

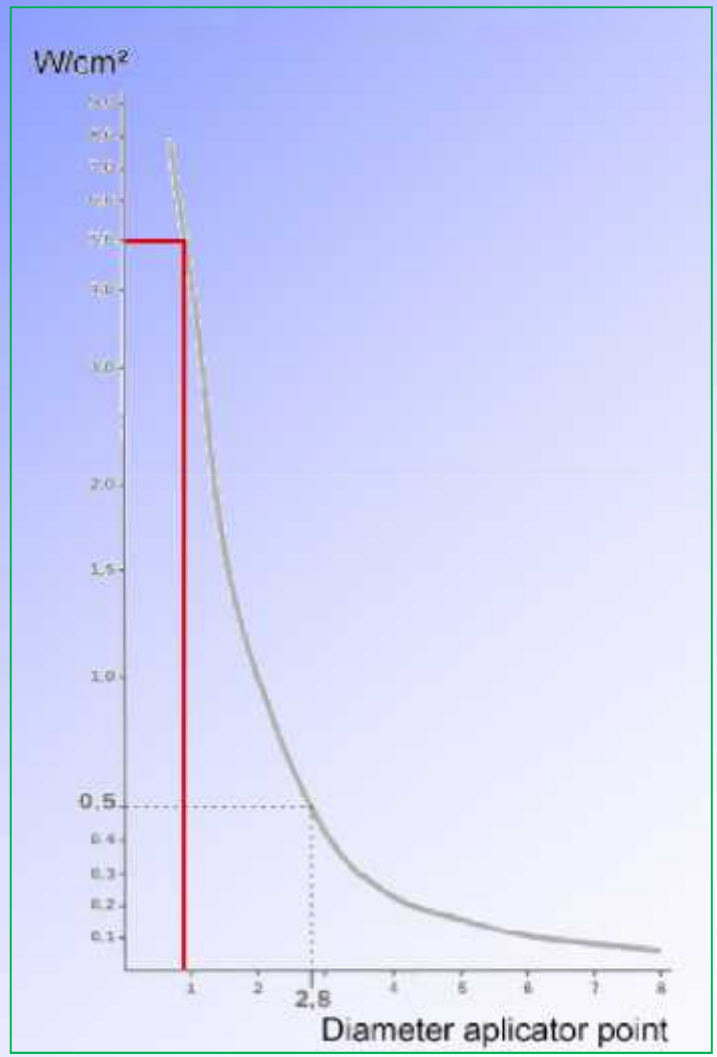
The optical power density

Power density in W/qcm

Dependent from optical diameter of the applicator

Diagram:

Relation between the optical density and the optical diameter of the applicator of a 30 mW laser



The optical power density

Laser power	Laser-spot diameter at the skin	Optical power density
50 mW	5 mm	0.25 W/cm²
50 mW	0.5 mm	25.5 W/cm²
50 mW	0.05 mm	2550 W/cm²

Tab. 1.1: Connection between laser power, laser-spot diameter and optical power densities.

Light dose of a 50 mW laserneedle

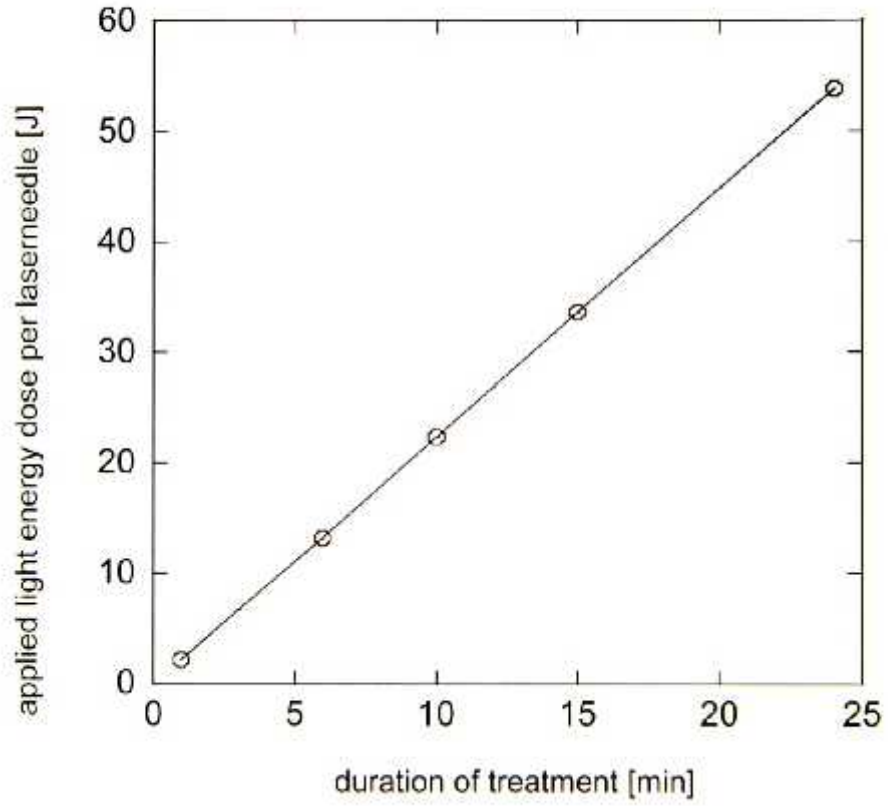
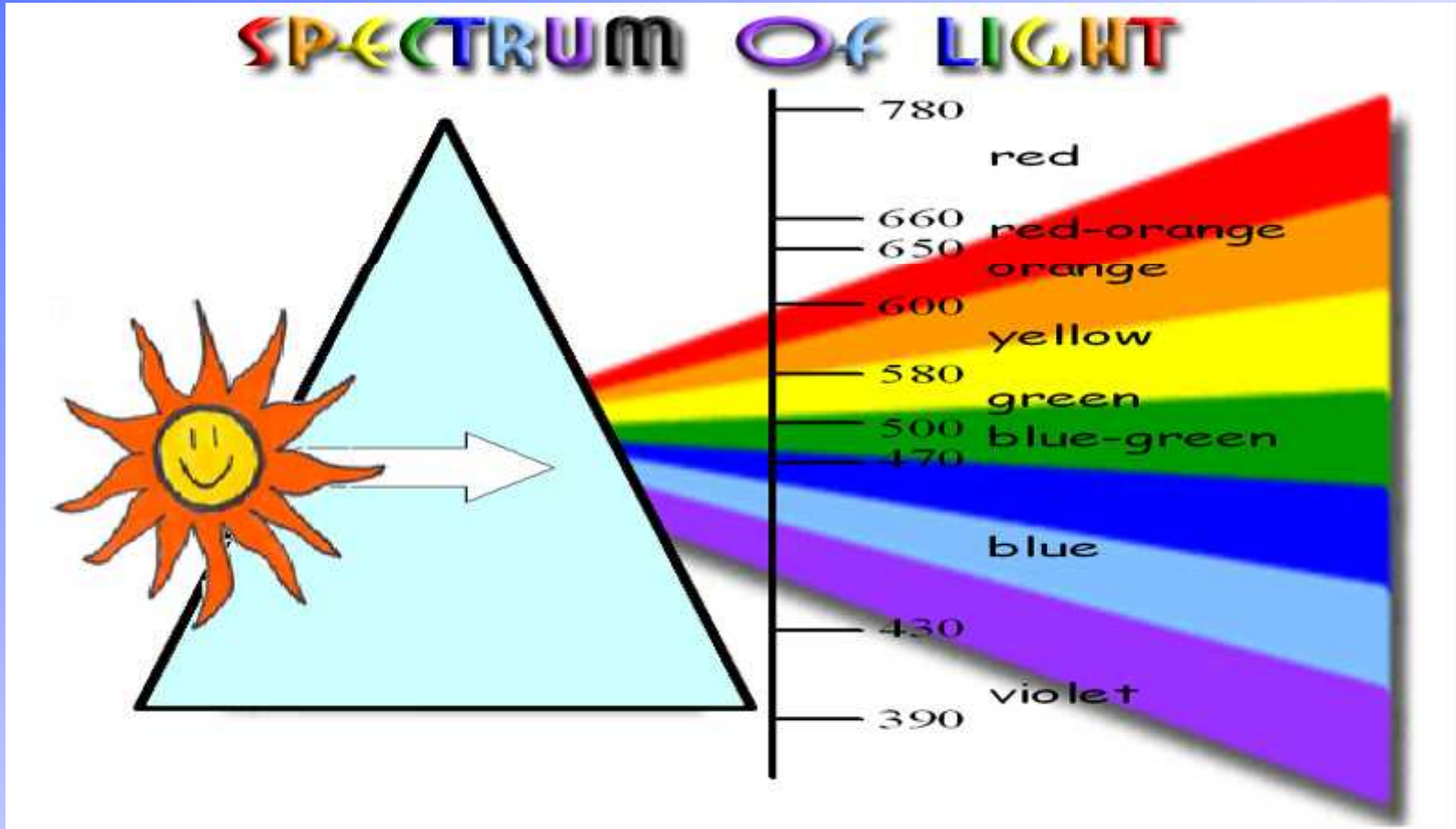
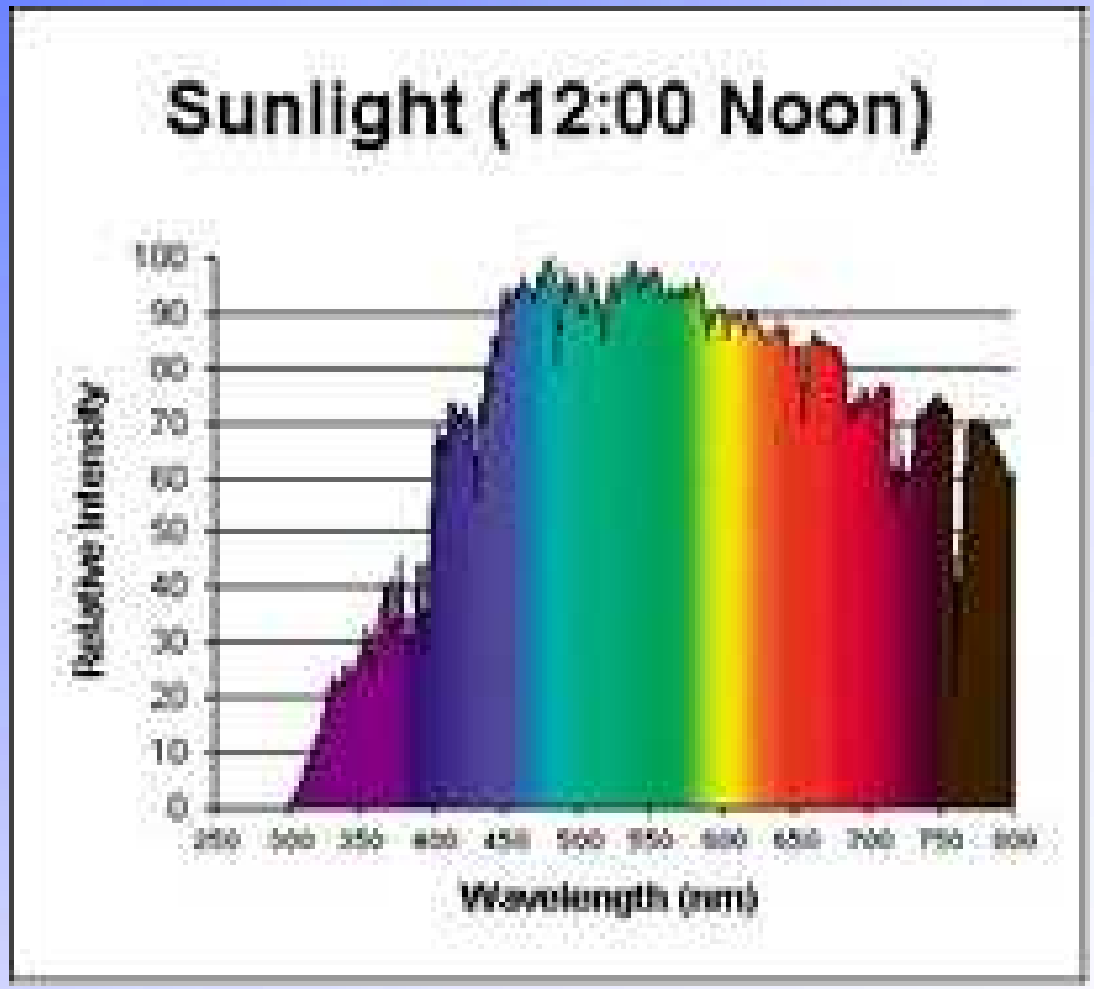


Fig. 1.6: Light dose of a laserneedle dependent on the duration of treatment.

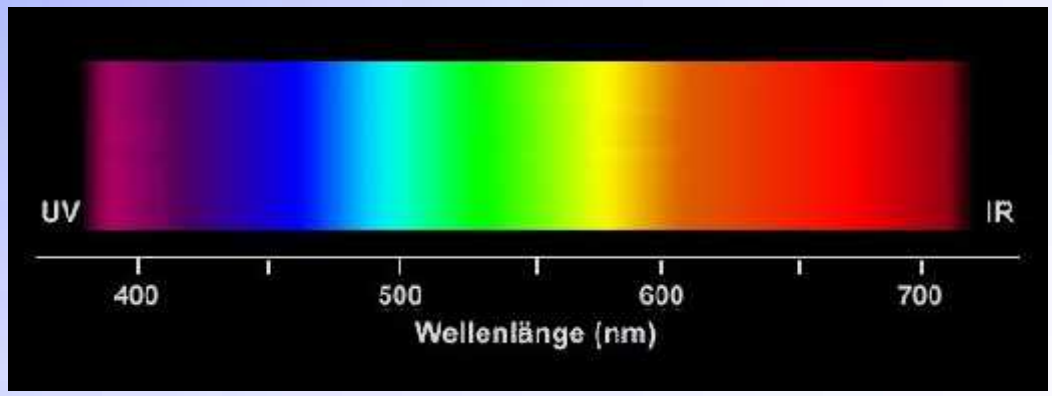
The sunlight spectrum



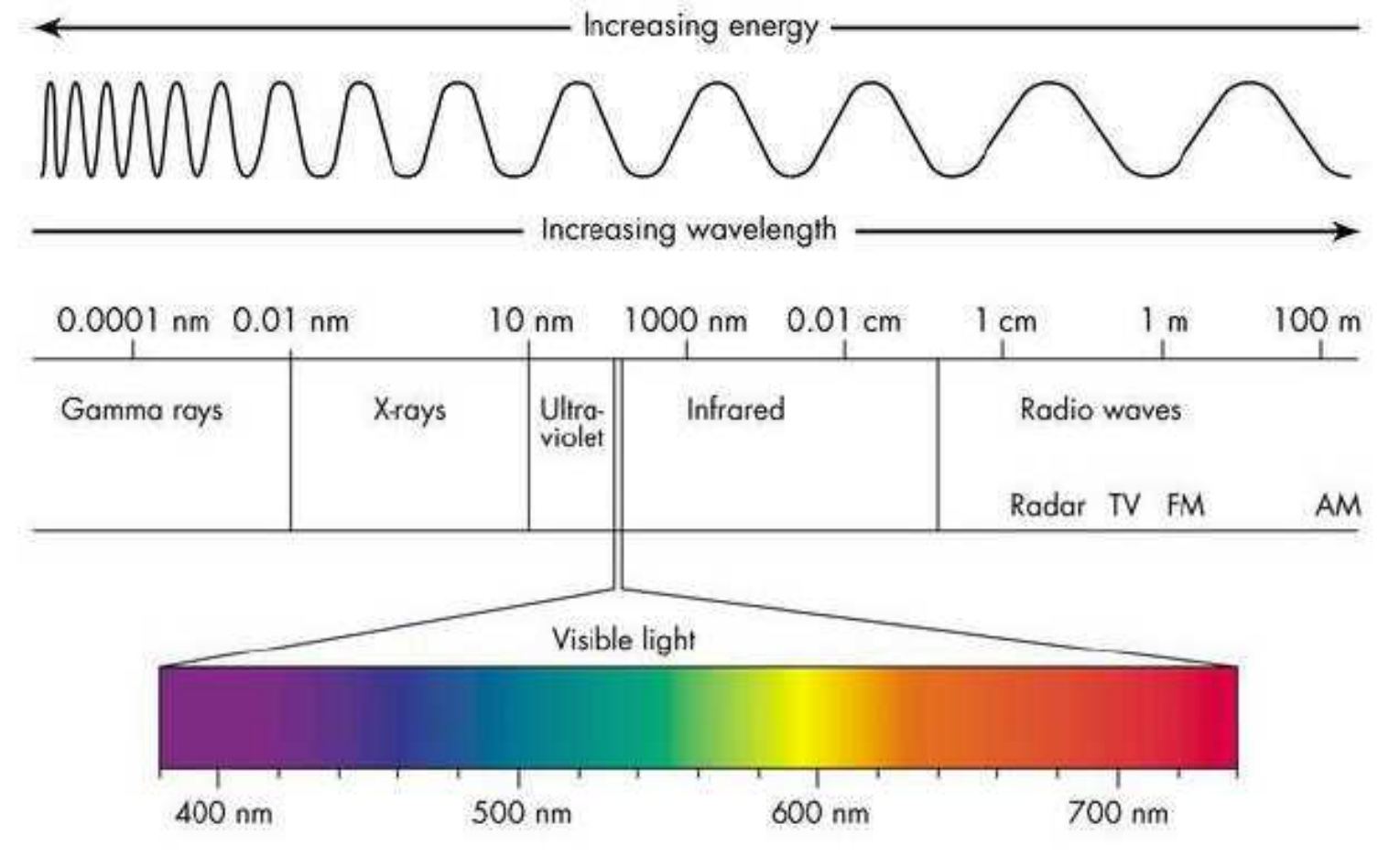
The sunlight spectrum



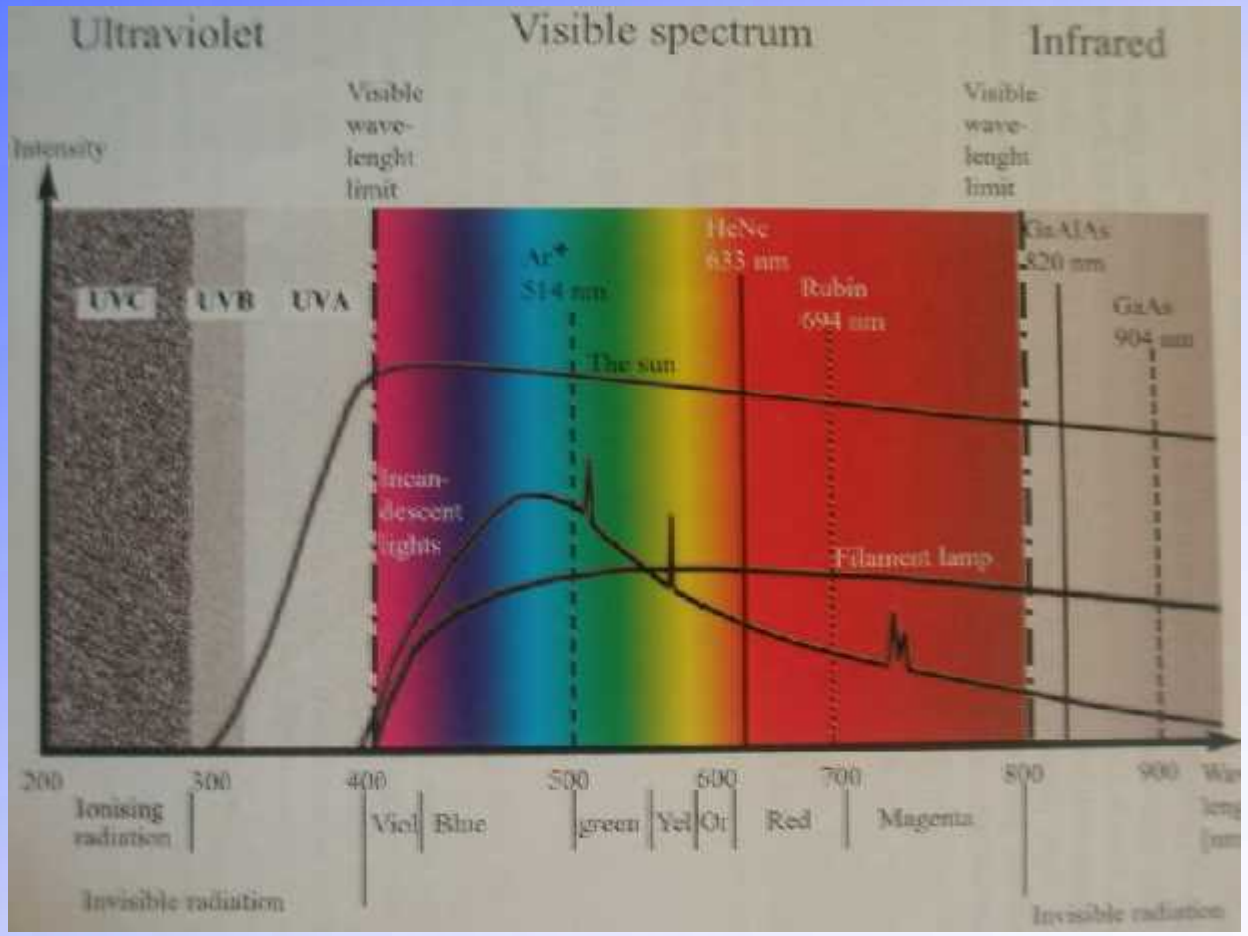
The visible spectrum of light



The electromagnetic spectrum

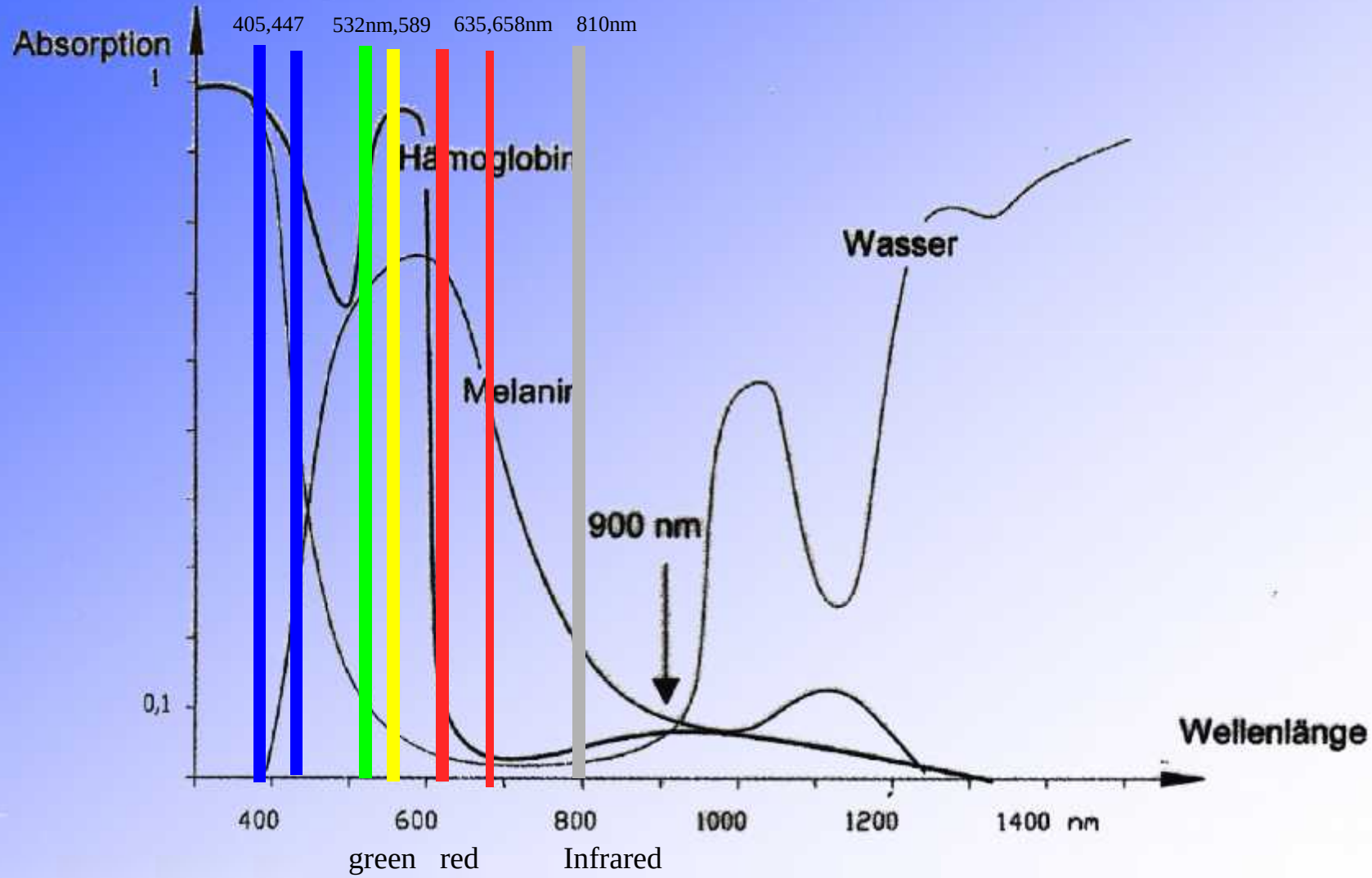


The natural spectrum of light

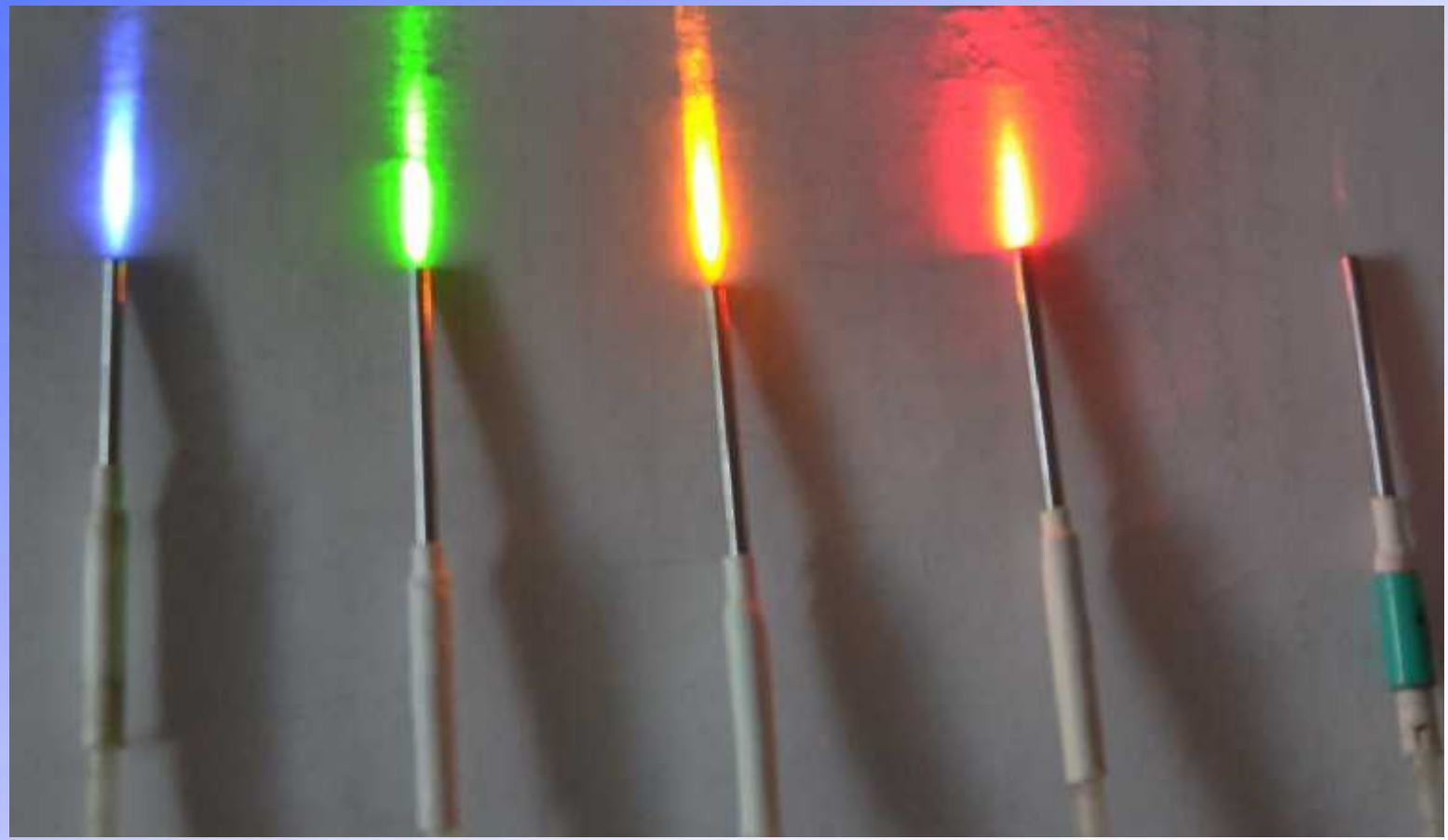


J. Tuner, L. Hode: Laser Therapy

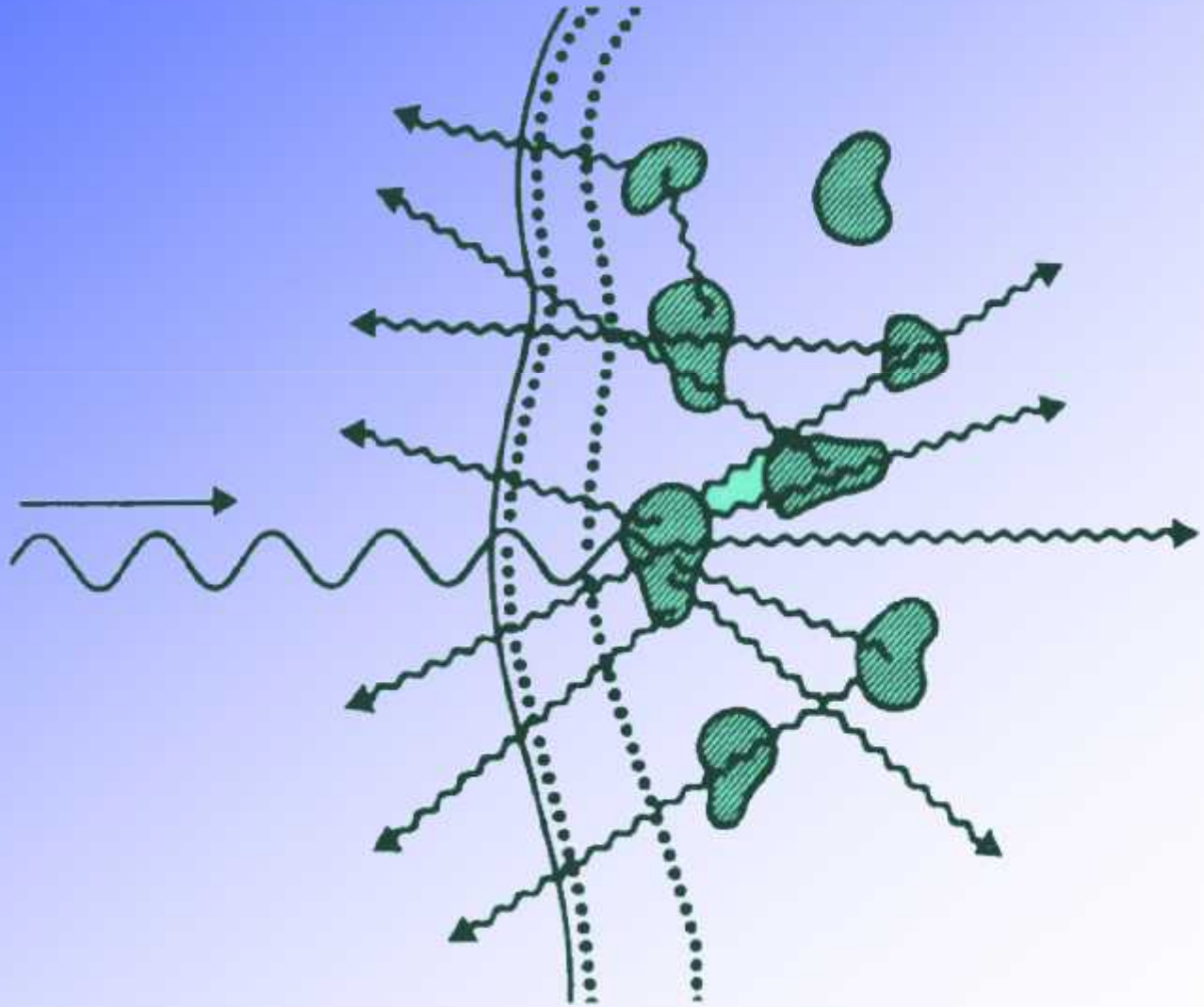
Absorption of laser light in biological tissue



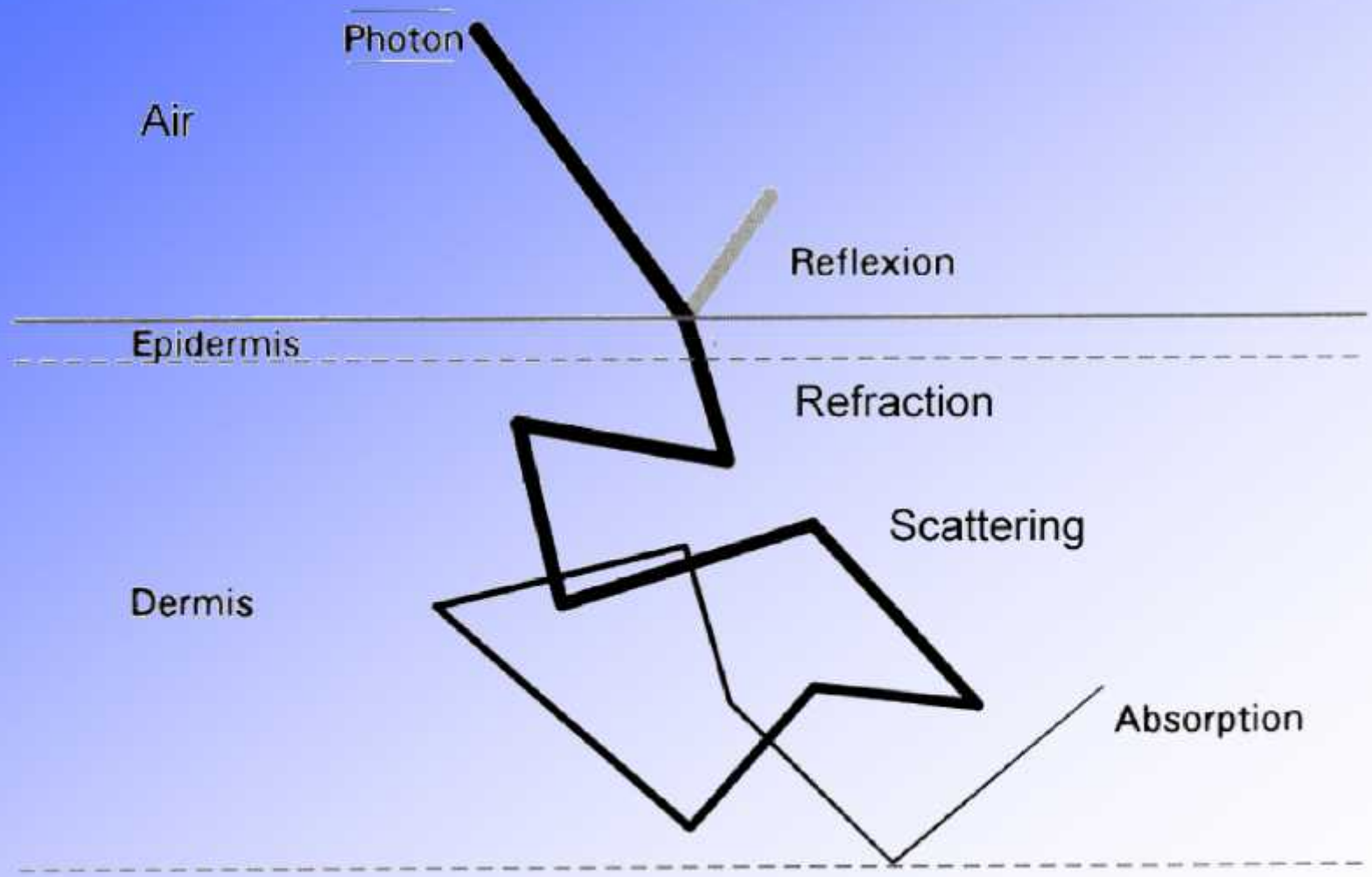
Fiberoptic laserneedles



The skin barrier

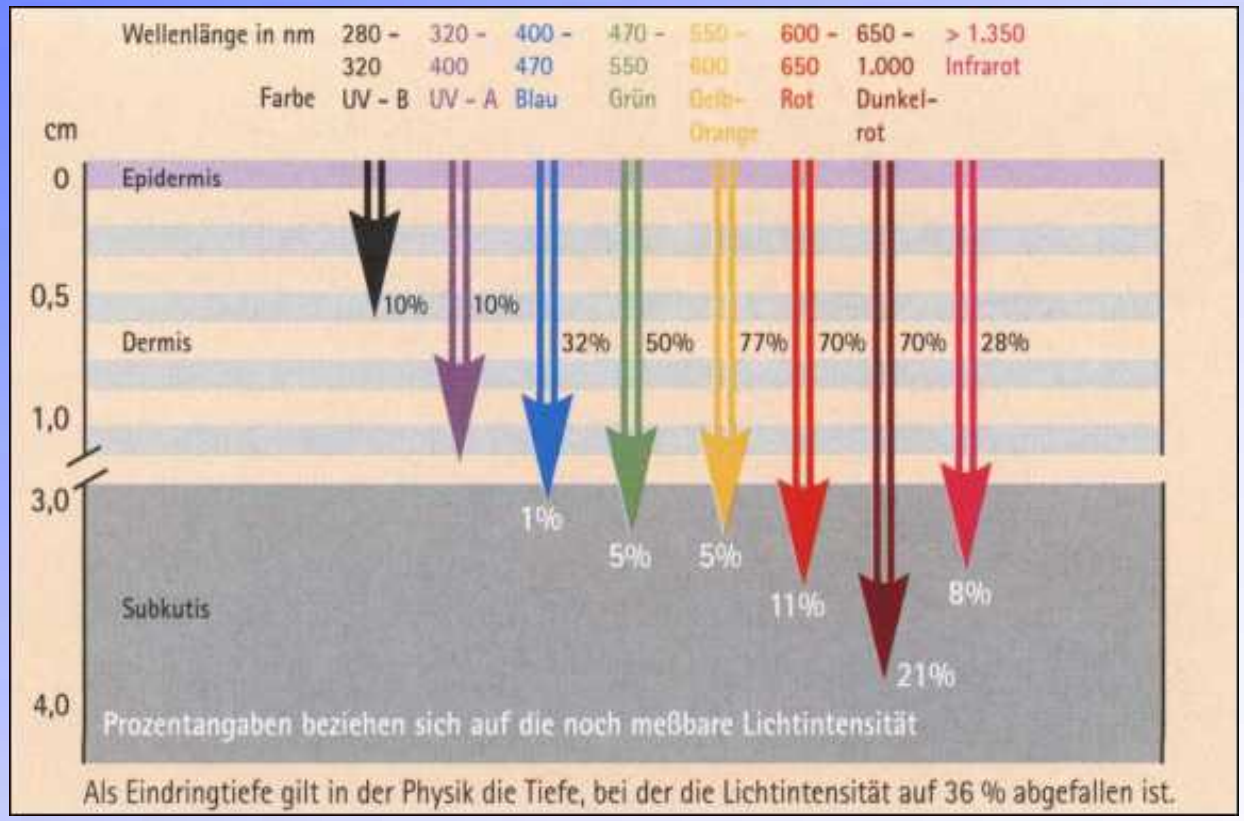


Disturbing effects of laser penetration in biological tissue



Optical penetration depth of different wavelengths

- *depends upon the wavelength*
- *Tissue penetration of blue laser very low, green laser ca. 5mm, red 3 cm, infrared 6 cm*



Red and infrared acupuncture with deepest stimulation

Biological molecular basics of LLLT

The absorption and action spectrum

- shows the effects of photons dependent from the wavelength and applied energy
- is similar to the absorption spectrum of the special photon receptors of the cells

Fig. 3: The absorption spectrum of chlorophyll a

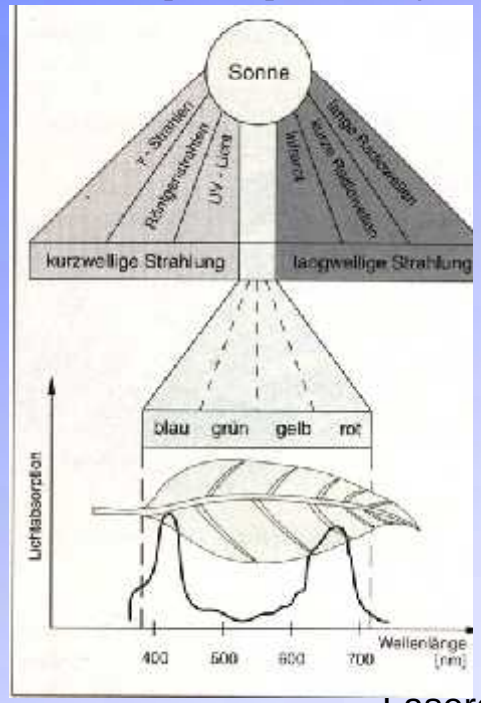
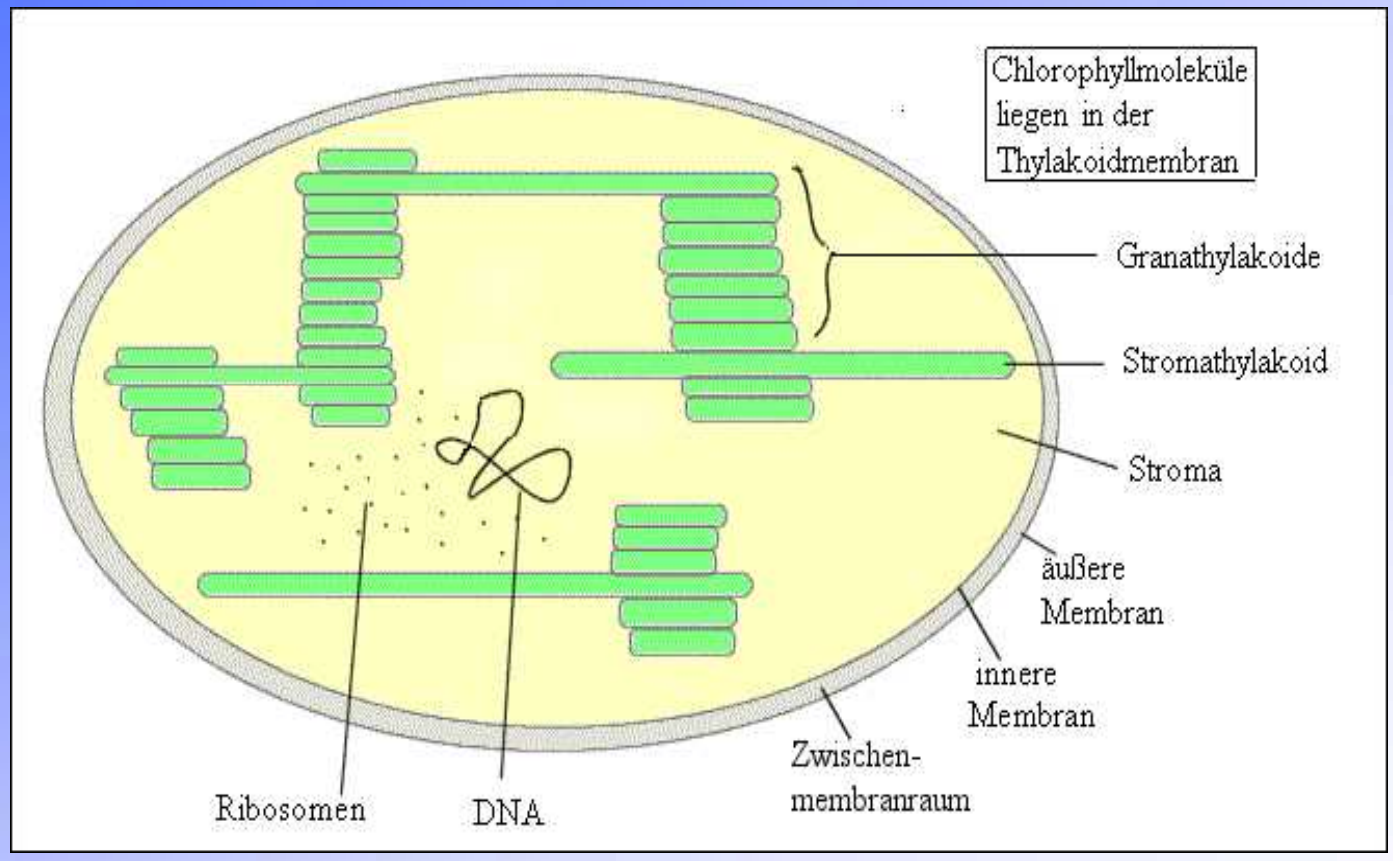


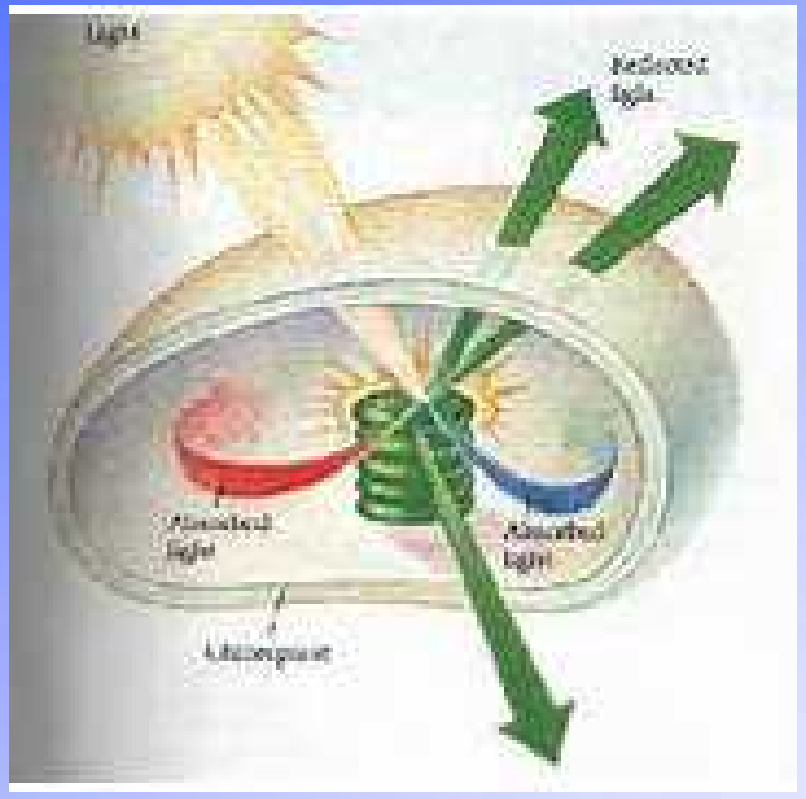
Fig. 3 shows the absorption spectrum of chlorophyll a of the green plants.

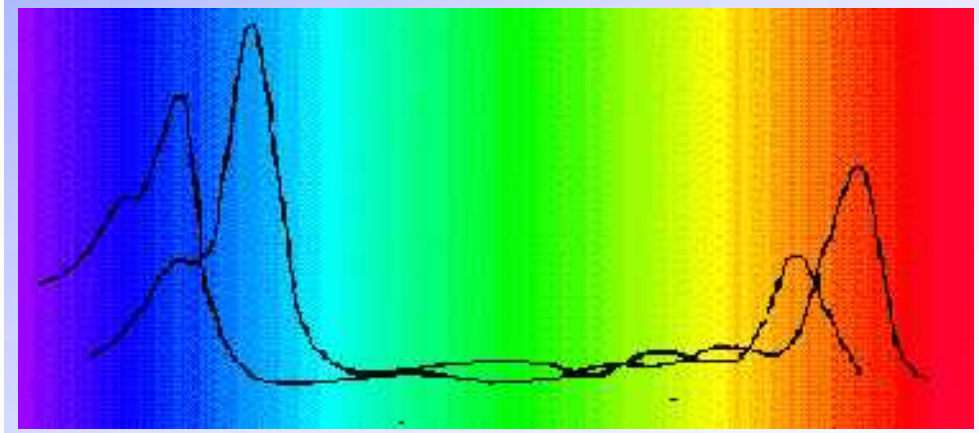
Chlorophyll absorbs light of the blue and infrared wave spectrum

Structure of the Chloroplast

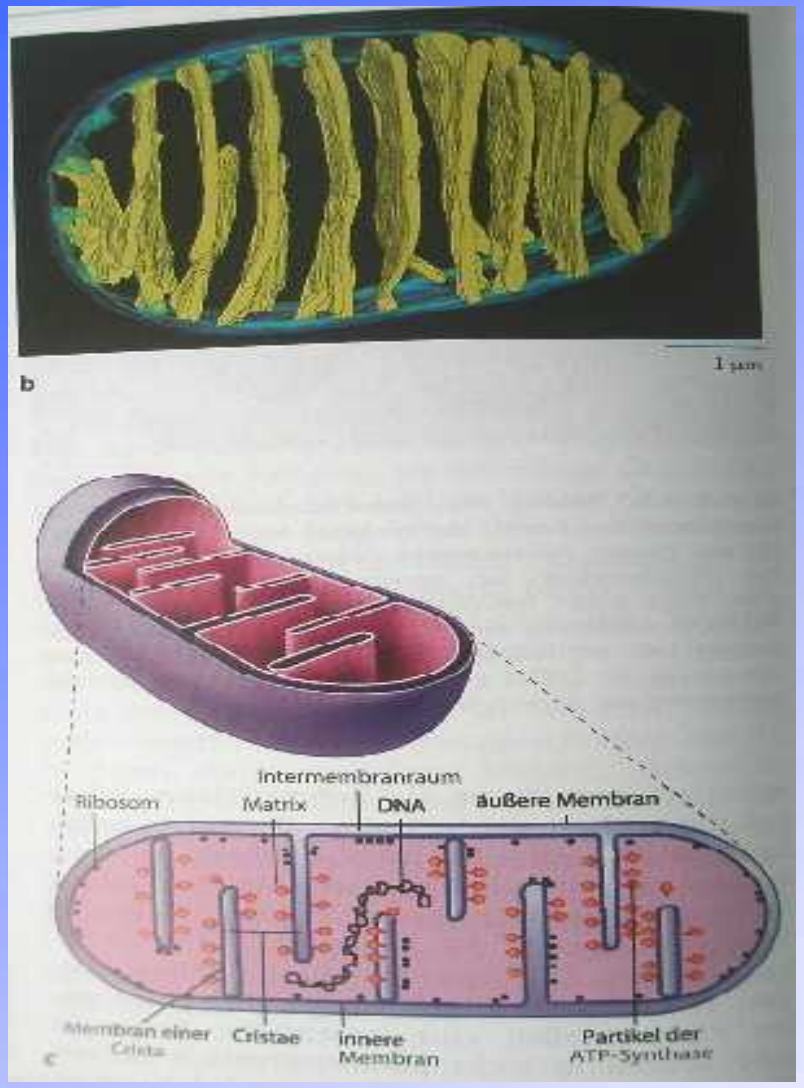


Chloroplast light absorption





The structure of the mitochondria



Laserclinic Dr. med. Dipl. chem. Michael Weber, Germany

The structure of the mitochondria can be different in the special types of tissue cells.

In living cells mitochondria have a dynamic structure; this means that they can vary their structure and size. They are able to merge or to divide themselves.

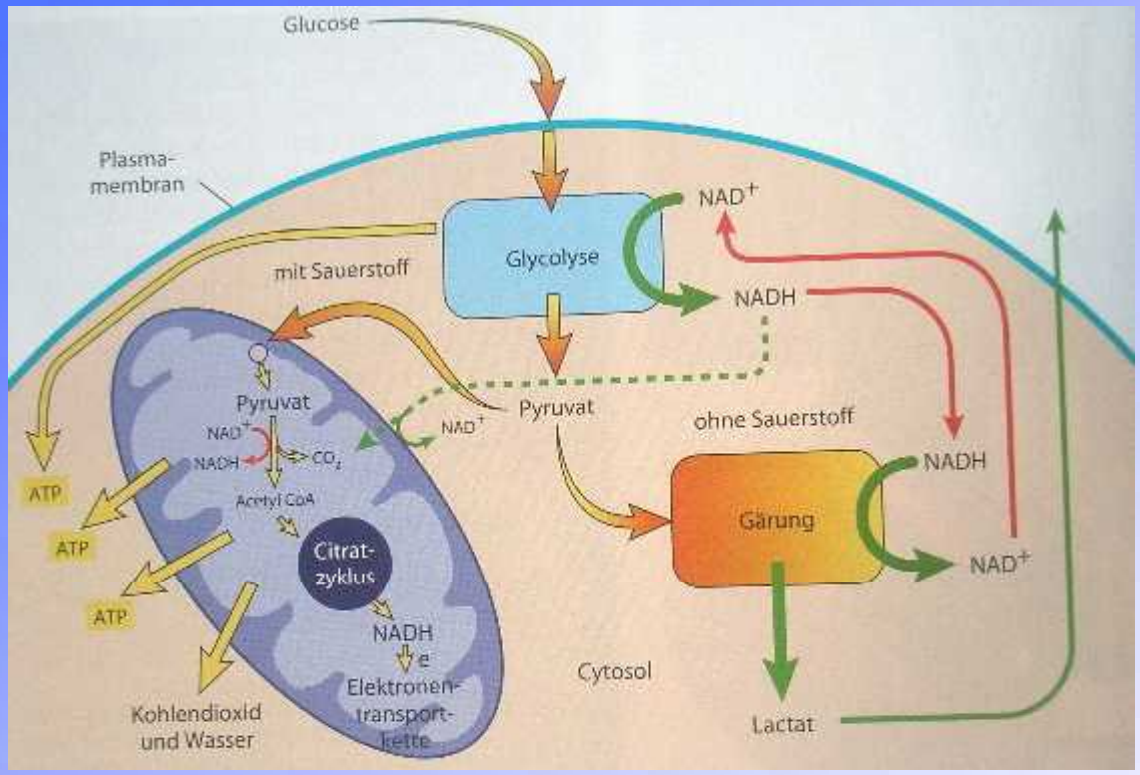
The mitochondria are making out about 10 – 15 % of the volume of a living cell.

Their main task is the production of ATP

The mitochondria have an inner and outer membrane.

In the inner room of the mitochondria we can find the christae, formed by double layer membranes, where the respiratory chain is located and the production of ATP.

The carbohydrate metabolism of eucaryotic cells

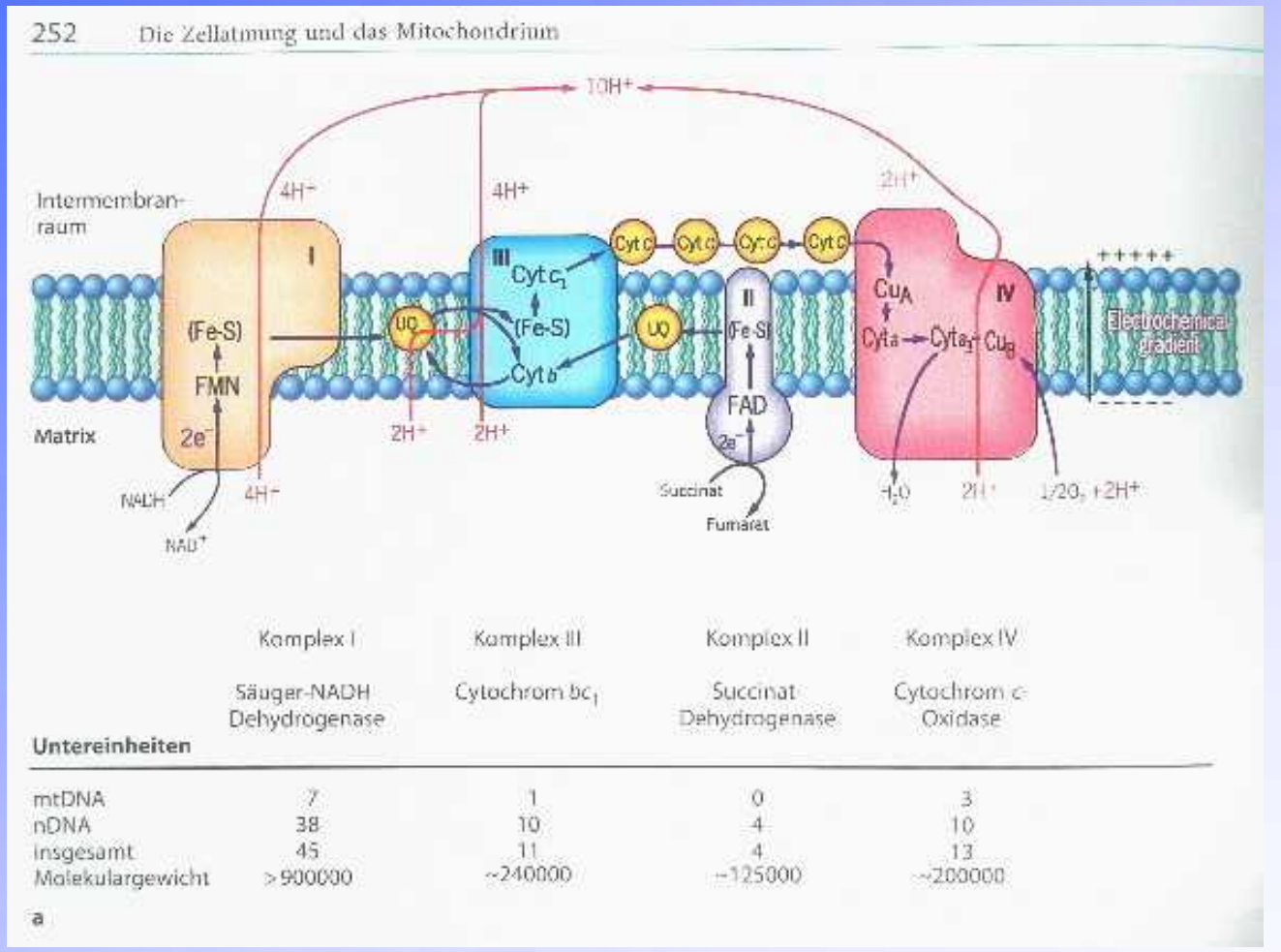


In figure 9 we see an overview about the carbohydrate metabolism of eucaryotic cells. In the glycolysis we find in the cytosole the production of pyruvate and NADH. Without oxygen the pyruvate is transformed in lacate. With oxygen pyruvate is infiltrated into the inner of the mitochondria and metabolised in Acetyle-Coenzyme-A. This is running through the citrate circle, where NADH and FADH2 are produced.

The electrons of these products are transferred to the electron-carriers of the respiratory

chain and in the last step on oxygen with the production of water. The released energy in these steps is needed for the production of ATP.

The respiratory chain in the mitochondria

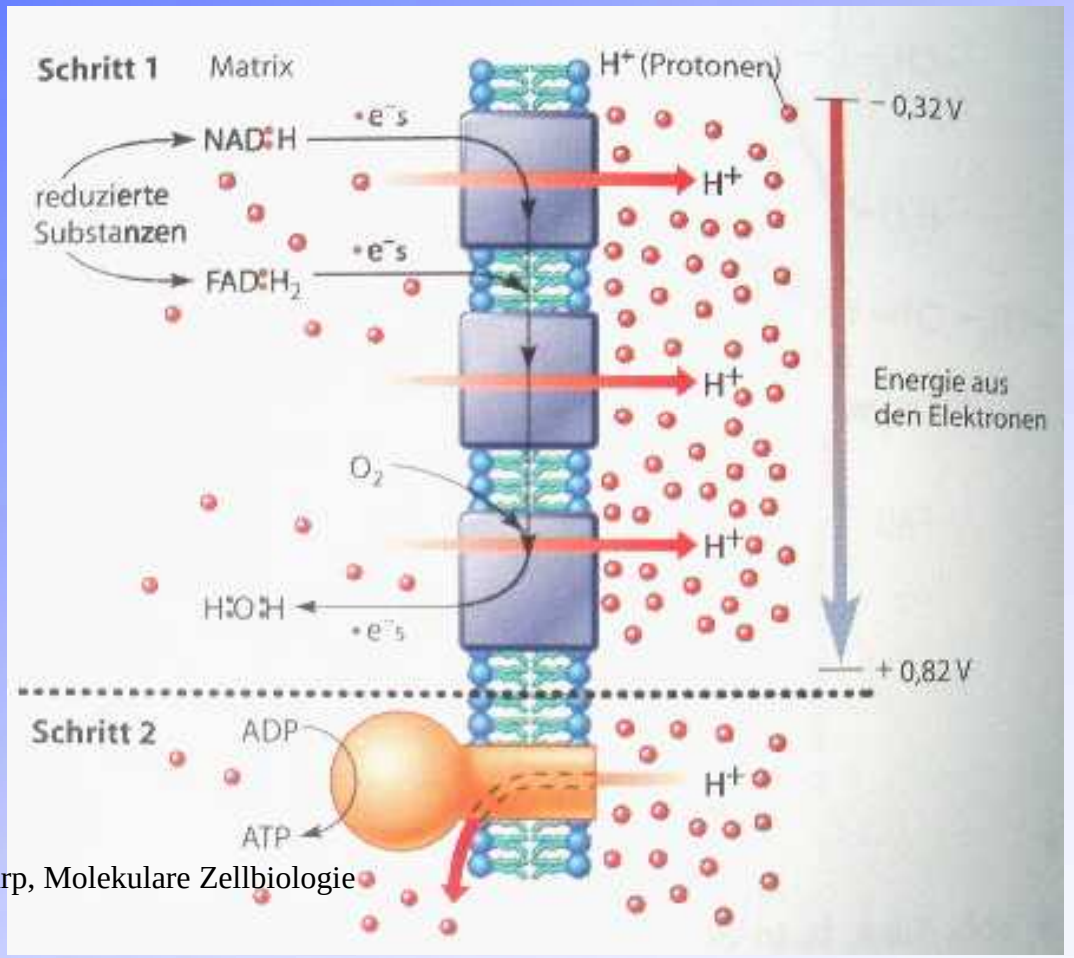


	Komplex I	Komplex III	Komplex II	Komplex IV
	Säuger-NADH Dehydrogenase	Cytochrom bc_1	Succinat Dehydrogenase	Cytochrom c-Oxidase
Untereinheiten				
mtDNA	7	1	0	3
nDNA	38	10	4	10
insgesamt	45	11	4	13
Molekulargewicht	>900000	~240000	~125000	~200000

a

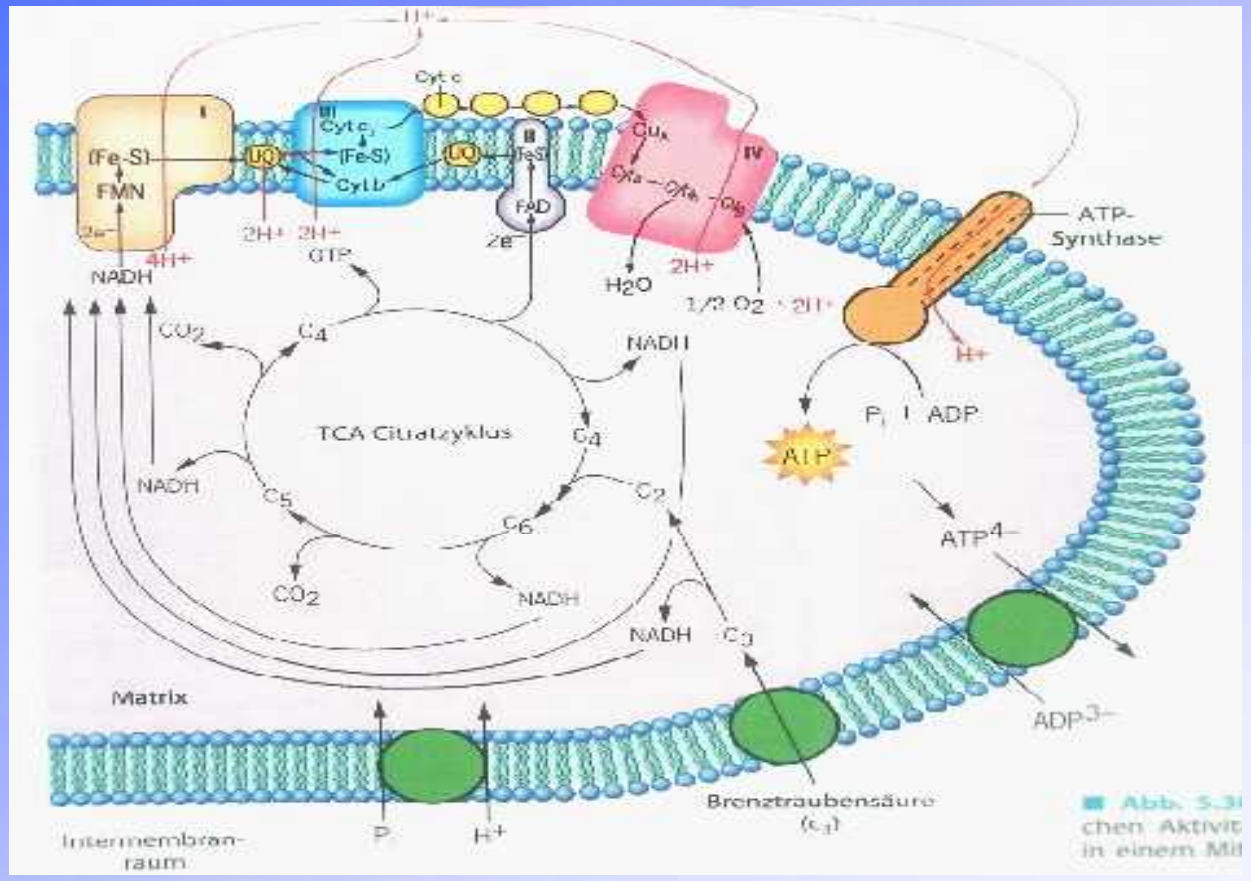
Karp, Molekulare Zellbiologie

The respiratory chain in the mitochondria



Karp, Molekulare Zellbiologie

The respiratory chain in the mitochondria



In figure 13 we find the processes of energy production in the mitochondria.

We should remember again that with the blue laser we will stimulate the starter complex NADH-dehydrogenase and with the red and infrared laser the end-complex cytochrome-c-oxydase.

The cellular signaling

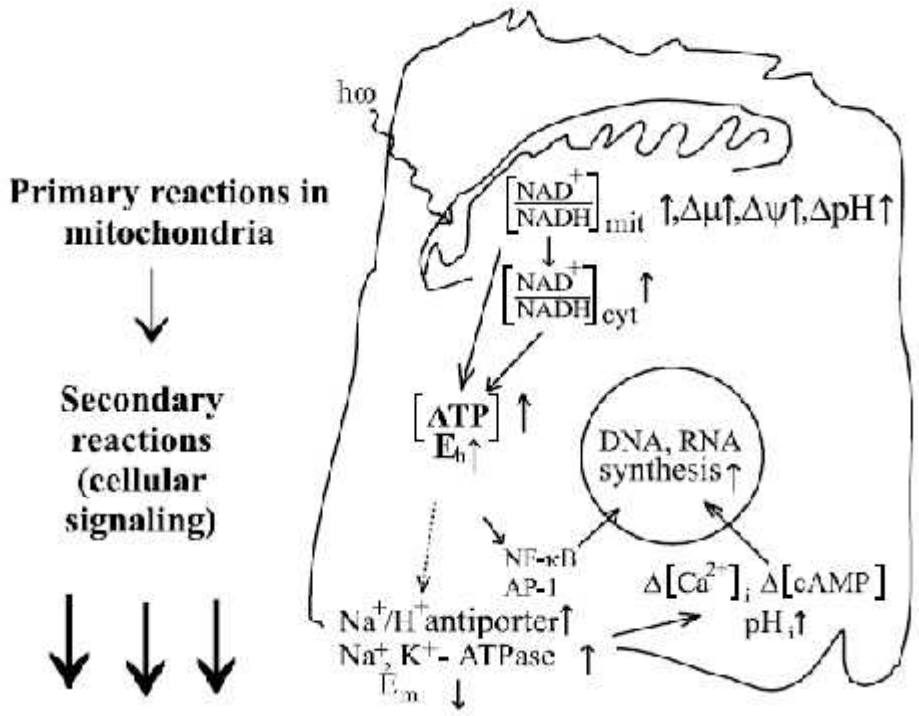
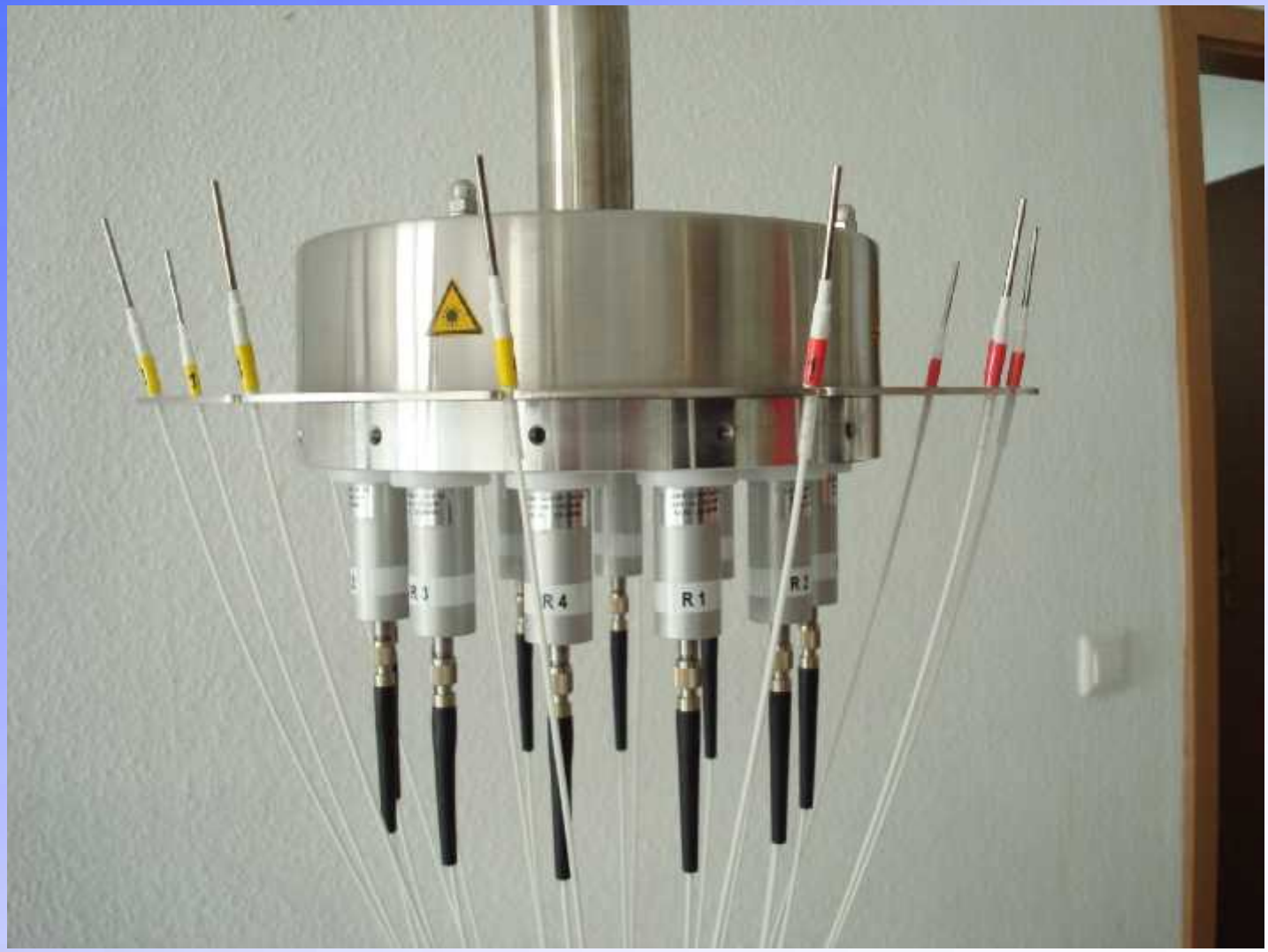


FIGURE 48.9 Scheme of cellular signaling cascades (secondary reactions) occurring in a mammalian cell after primary reactions in the mitochondria. E_h ↑ = shift of the cellular redox potential to more oxidized direction; the arrows ↑ and ↓ indicate increase or decrease of the respective values, brackets [ ] indicate the intracellular concentration of the respective chemicals.

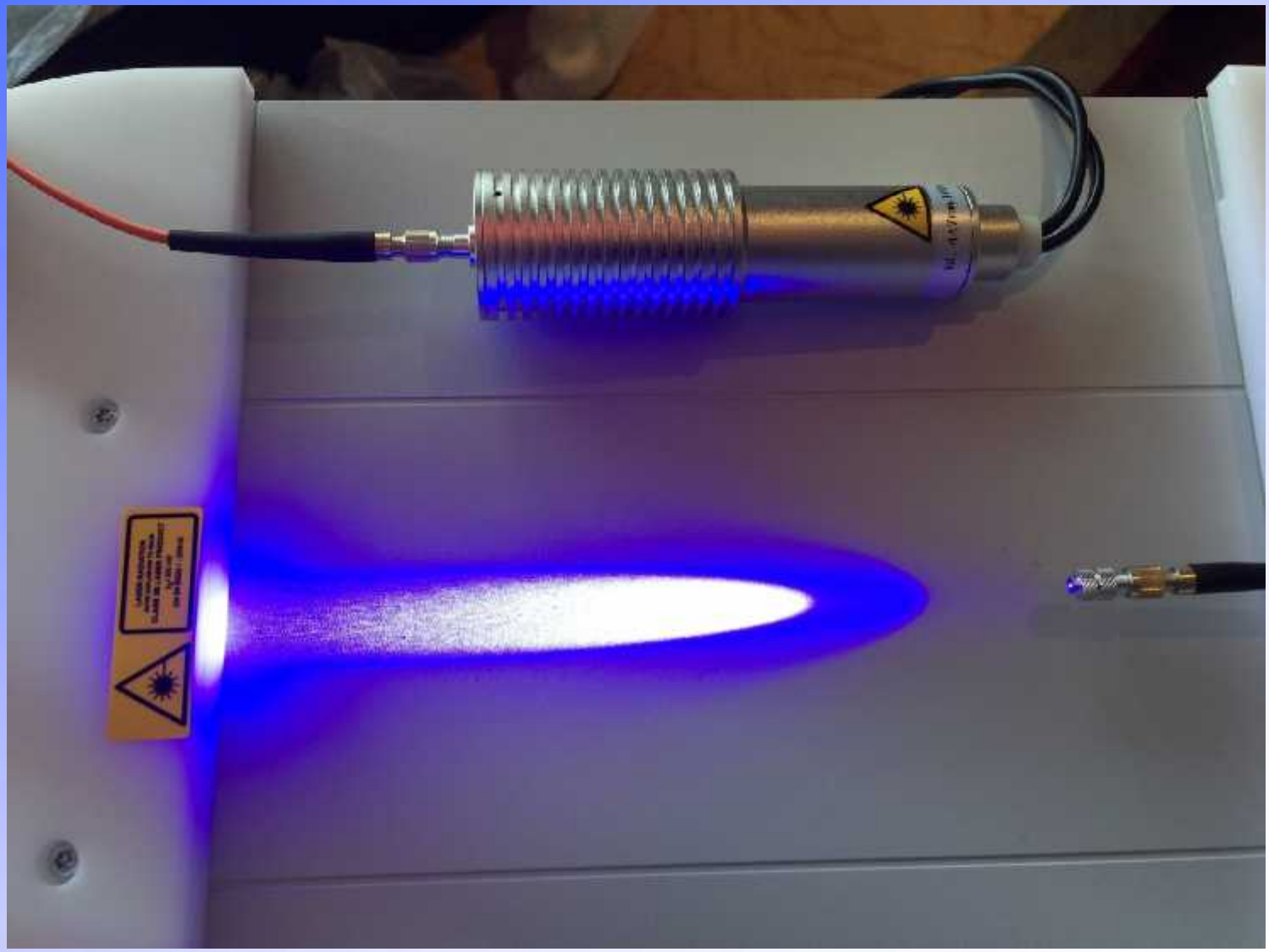
T. Karu, Low-Power Laser Therapy

Modern new Laser-Needle system for external laser therapy (acupuncture)

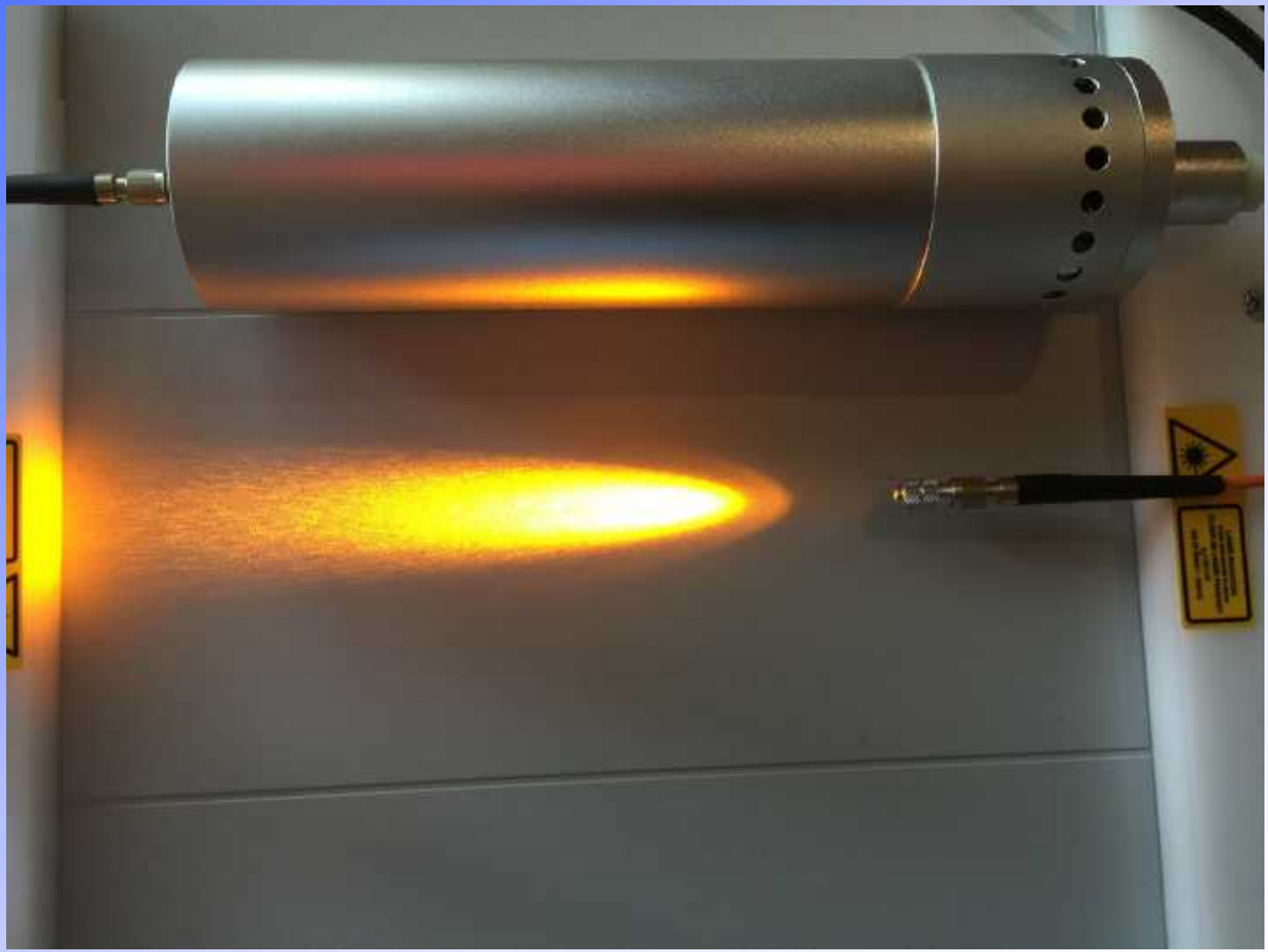
Modern new Laser-Needle system for external laser therapy (acupuncture)



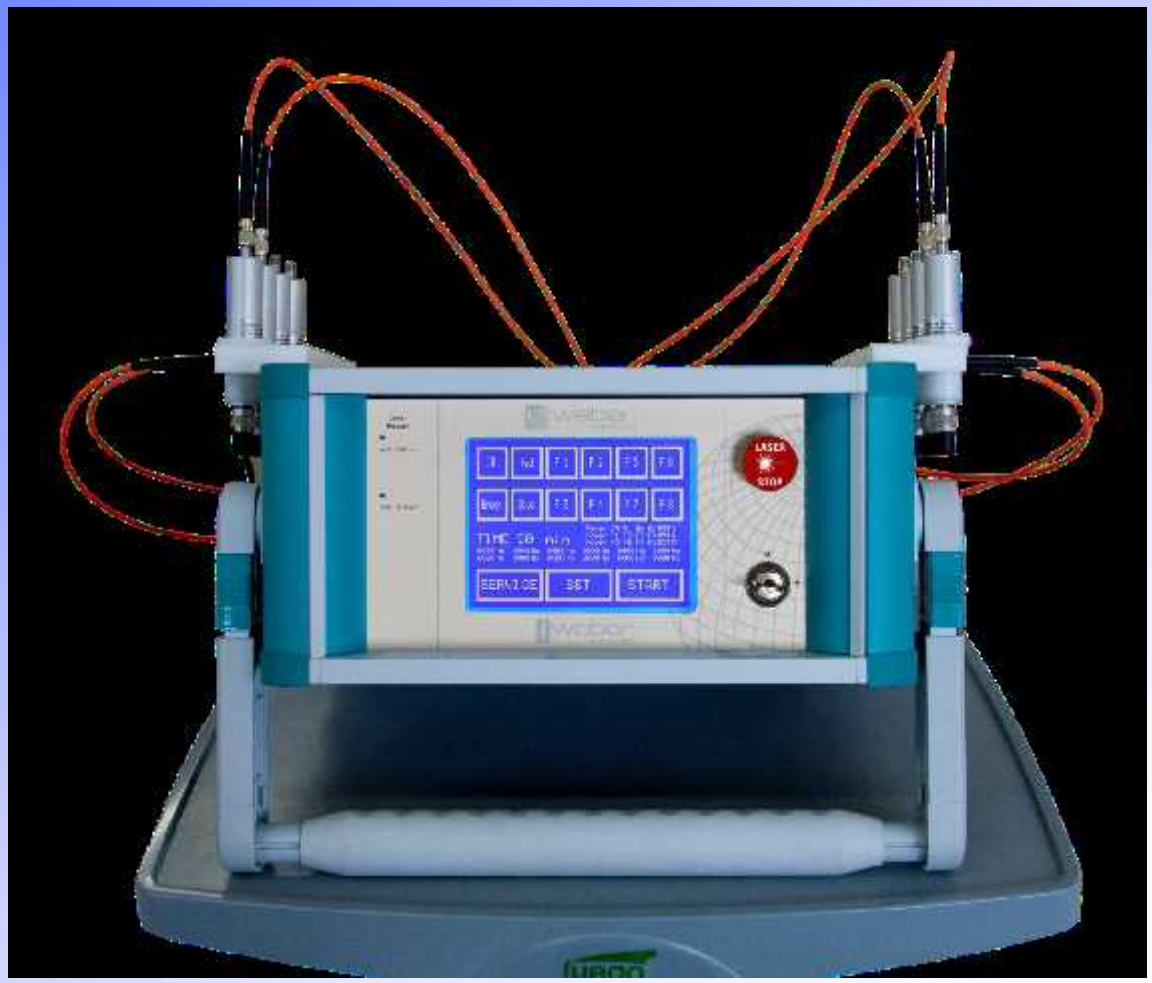
New blue laser 447 nm



New yellow laser 589 nm

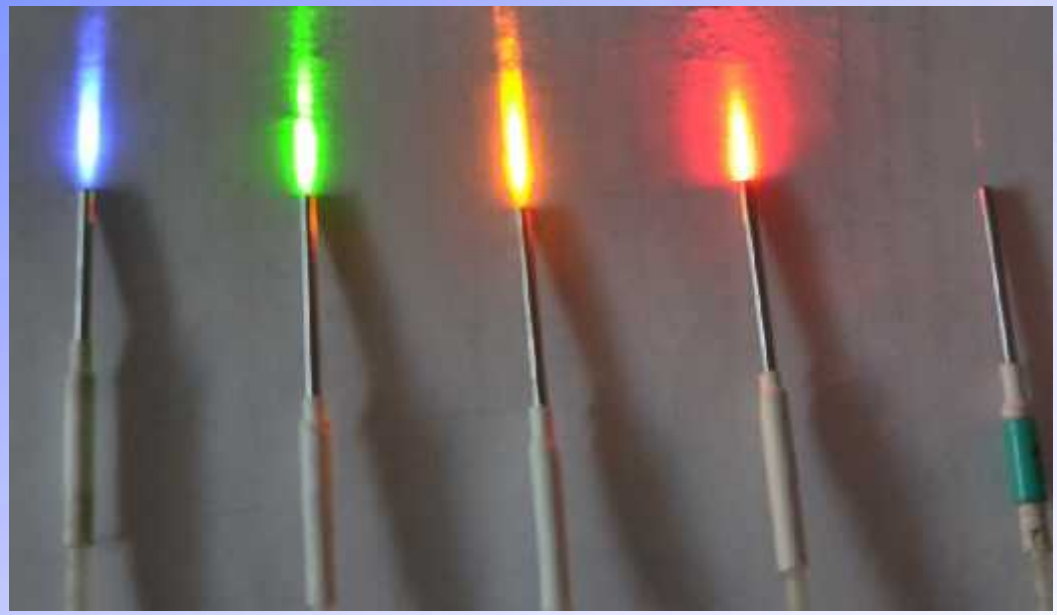


Weberneedle 12-channel modular **Endolaser (Combi) system**



Laserneedles for external laser therapy and acupuncture

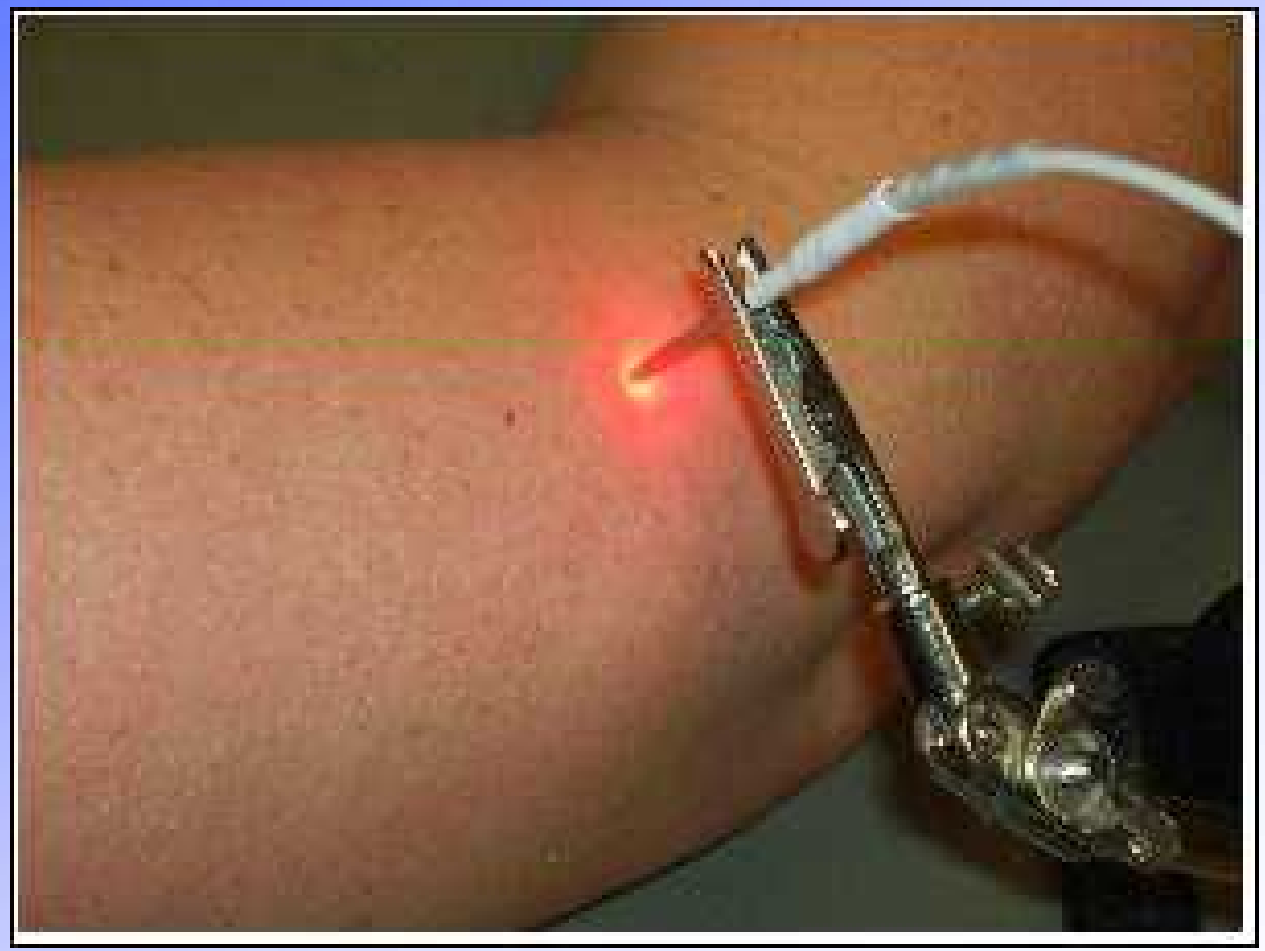
Laserneedles are the ends of optical fibers with high power density



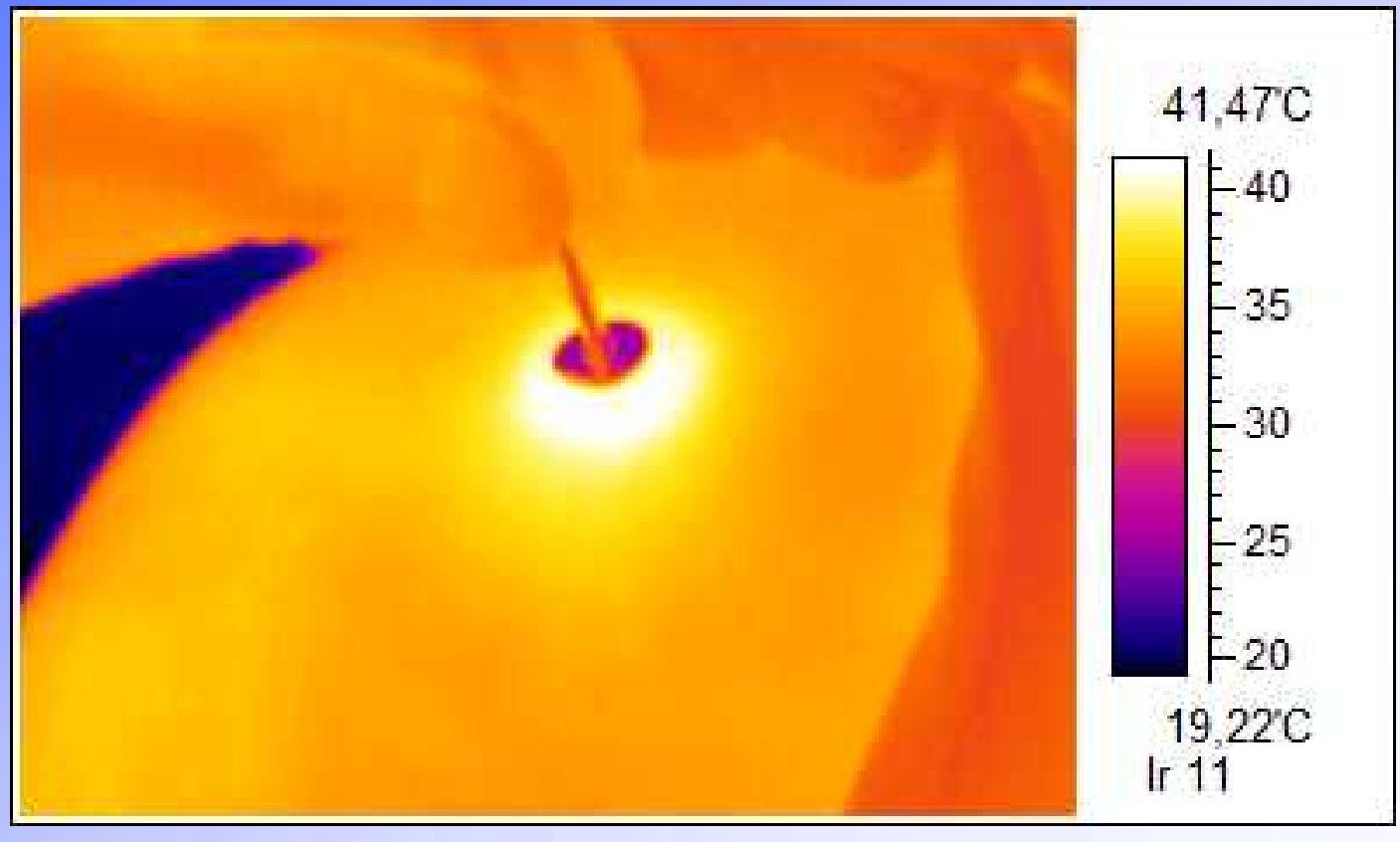
Laserclinic Dr. med. Dipl. chem.
Michael Weber, Germany

Application of laserneedles on the body

Laserneedle effects on tissue microcirculation



Laserneedle effects on tissue microcirculation in treatment of shoulder (single red laser 50 mW), FDA-approval, USA, 2008



Thermic effects of laserneedles (Litscher, 2002)

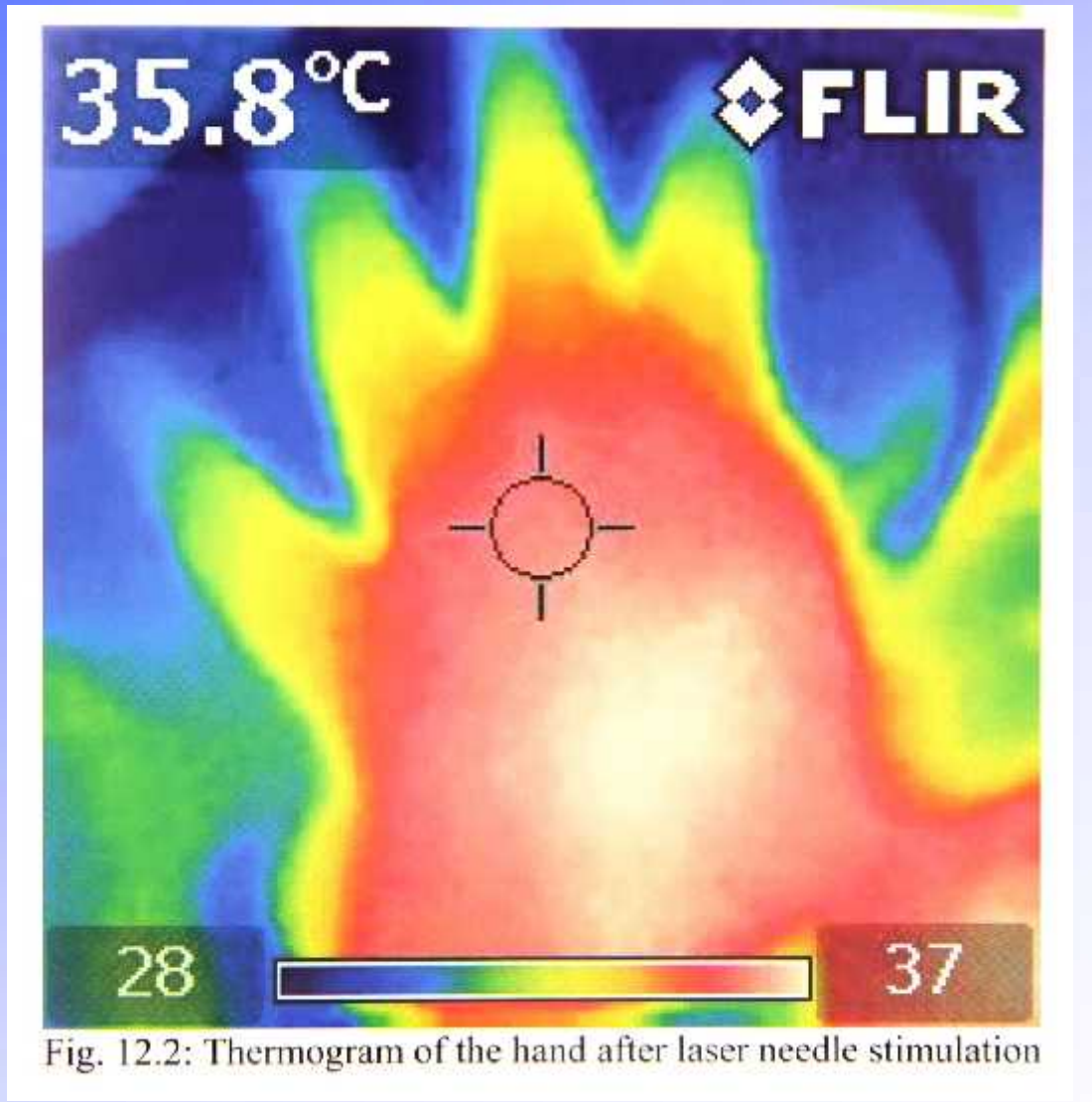


Fig. 12.2: Thermogram of the hand after laser needle stimulation

Effects of laserneedles on skin temperature and blood flow (Litscher 2002)

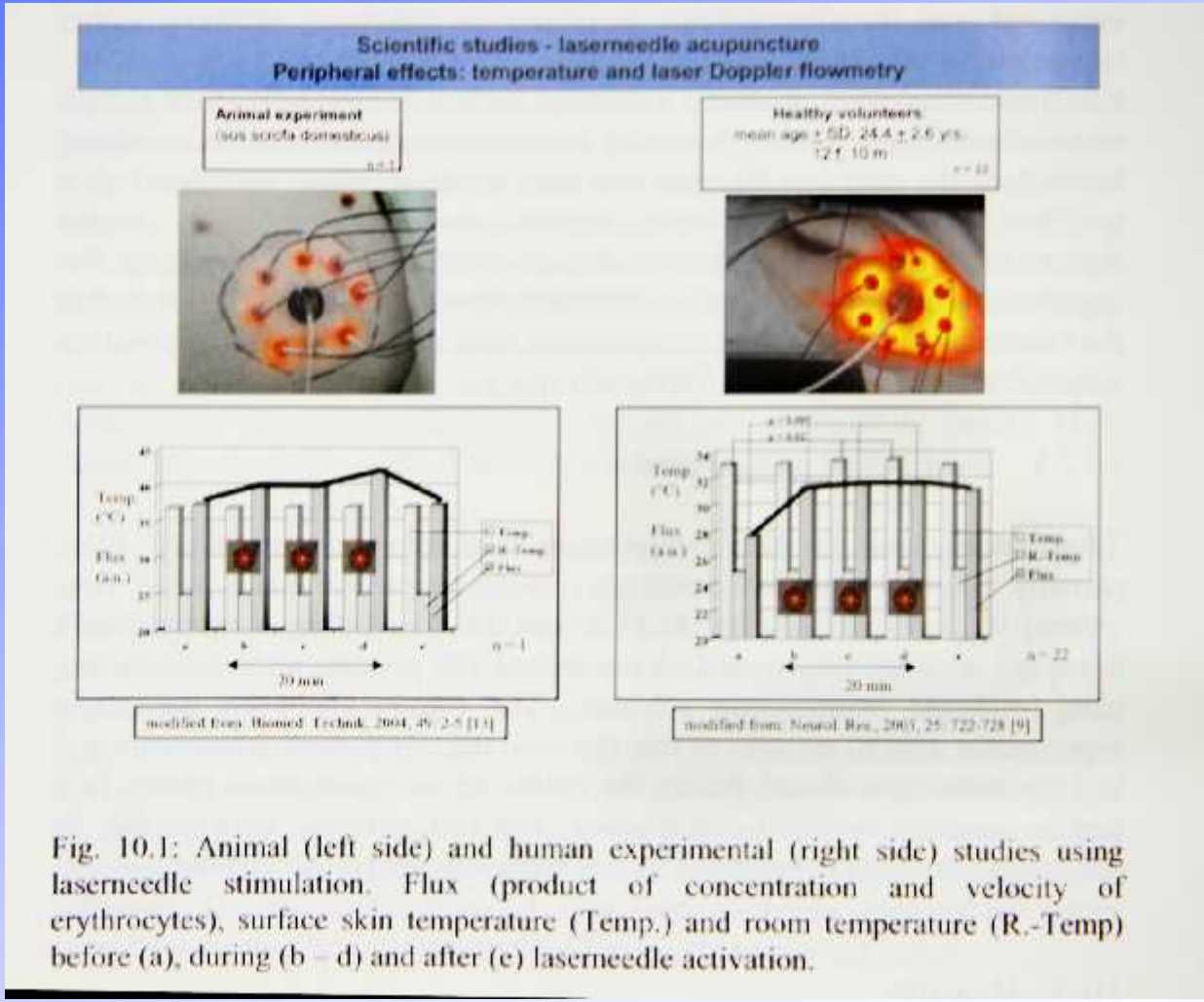


Fig. 10.1: Animal (left side) and human experimental (right side) studies using laserneedle stimulation. Flux (product of concentration and velocity of erythrocytes), surface skin temperature (Temp.) and room temperature (R.-Temp) before (a), during (b – d) and after (e) laserneedle activation.

Treatment with single Laserpen in comparison with laser needles

Protocol finger osteoarthritis

<u>End joints artritis</u>

(Heberden)

Treat directly on joints

(20 minutes, 50-100 %,any laser)

<u>Middle joints arthrits</u>

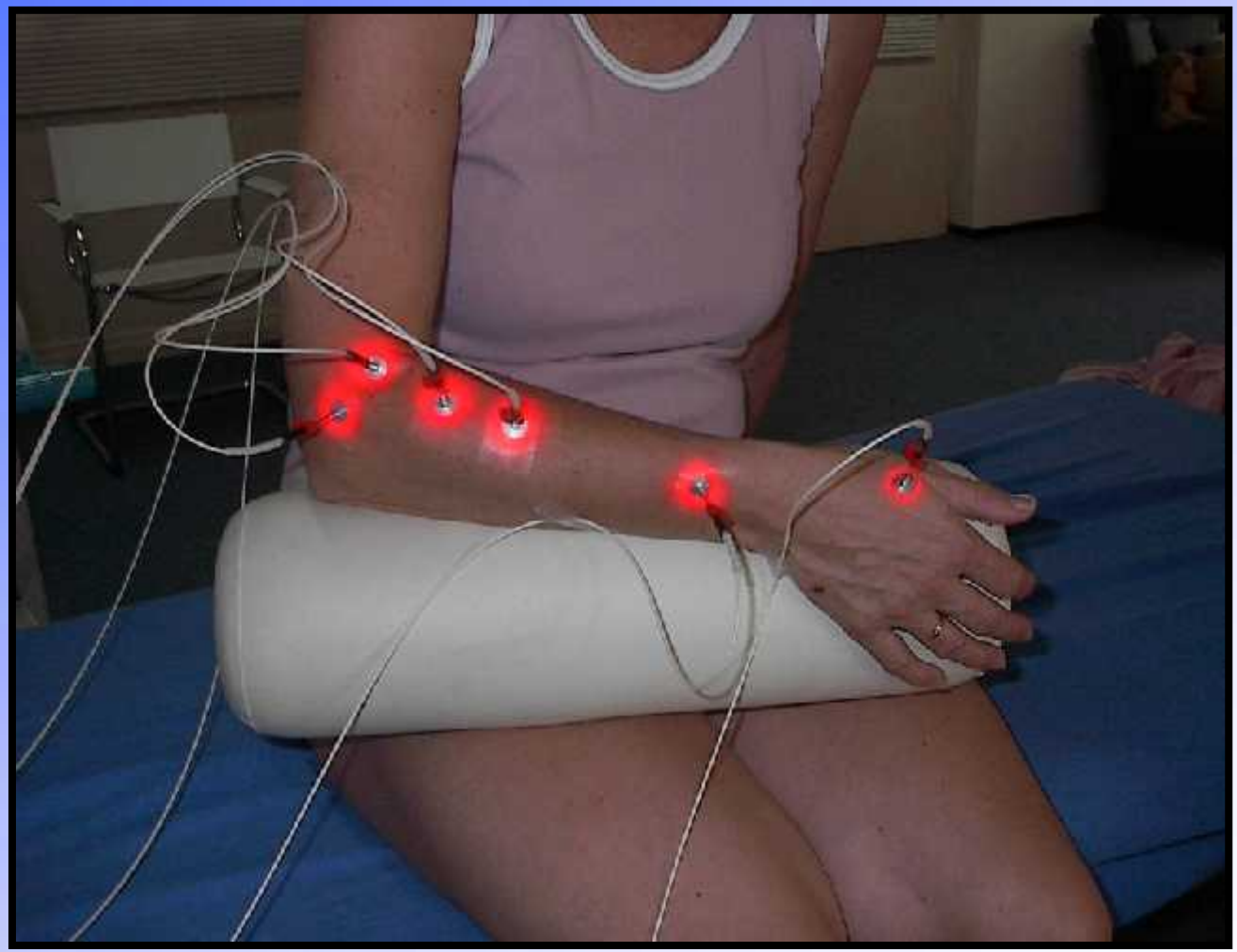
(Bouchard)

Same protocol on middle

Joints

(20 minutes, 50-100 %,any laser)

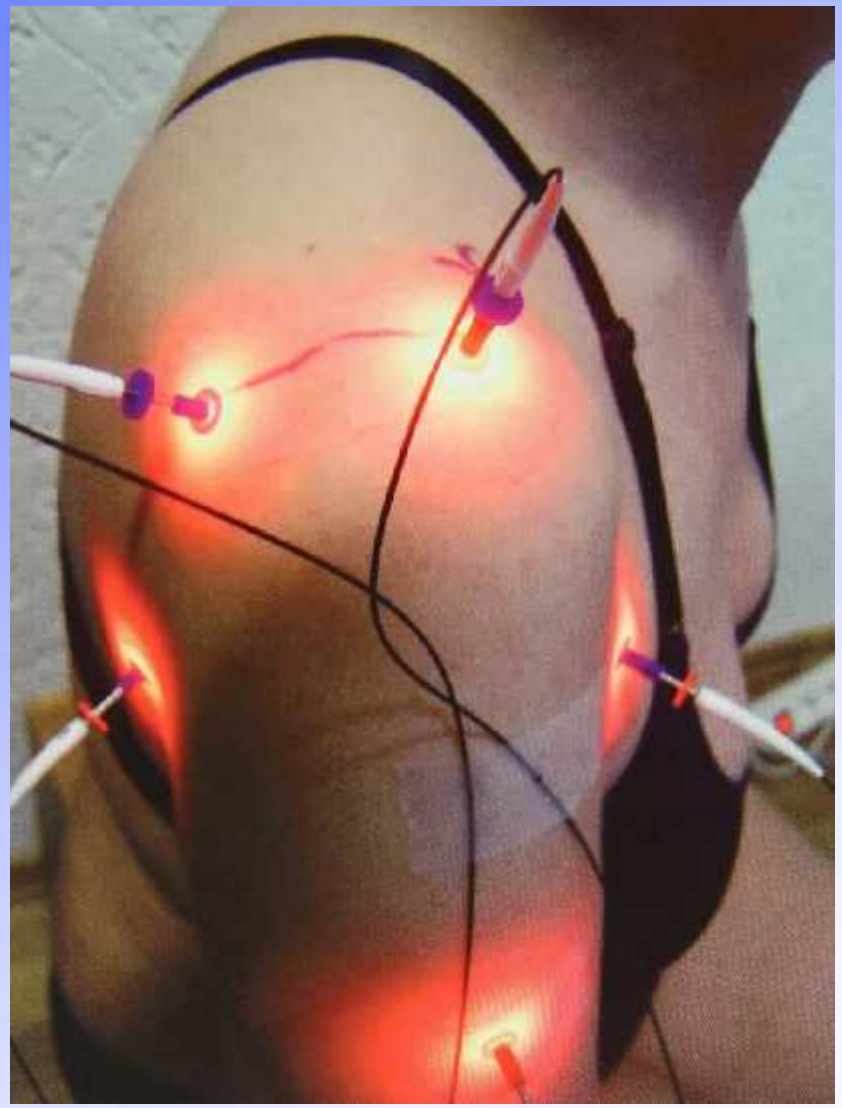
Tennis ellbow



Tennisellenbogen

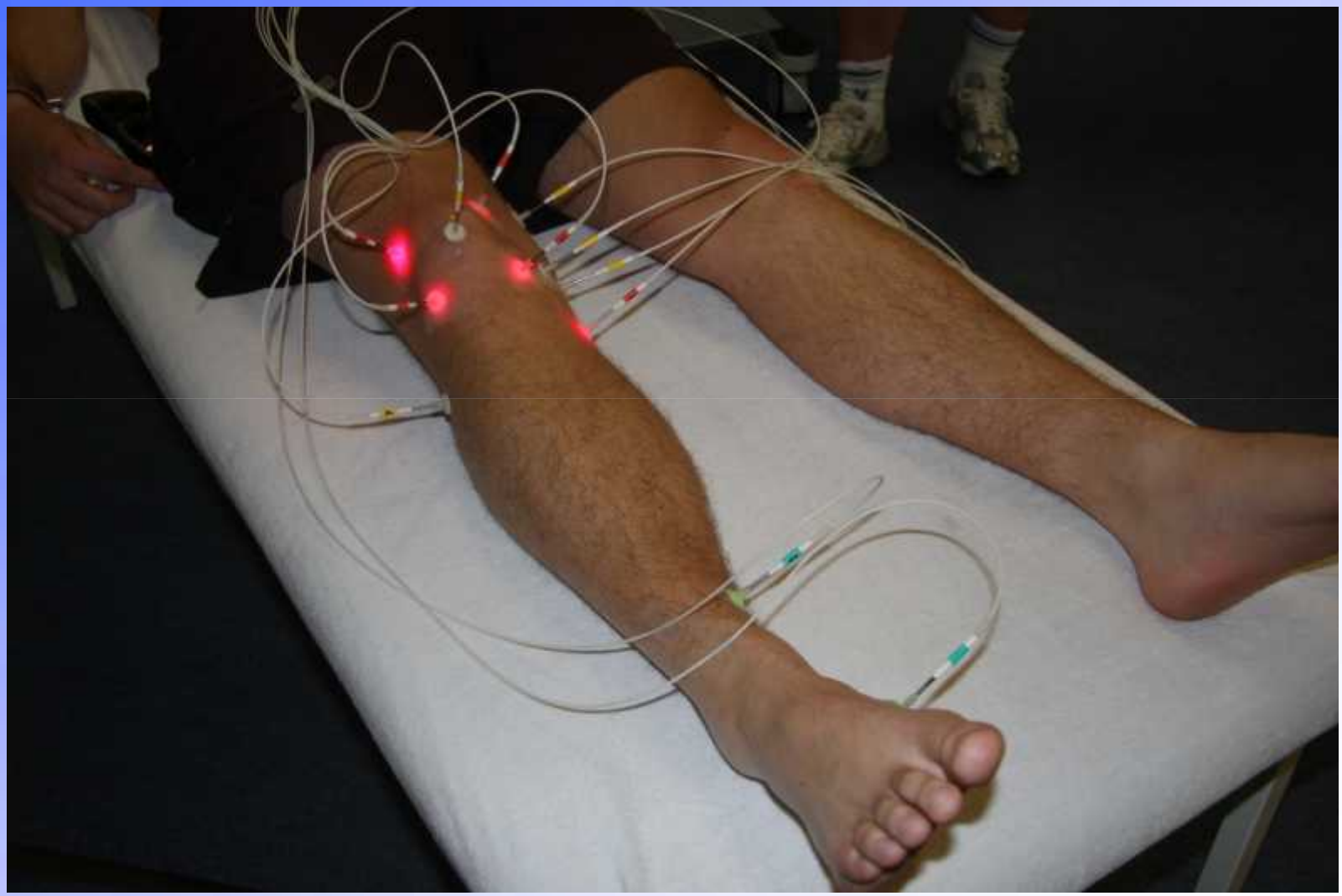
Shoulder syndrome

Shoulder syndrome



Shoulder arm syndrome

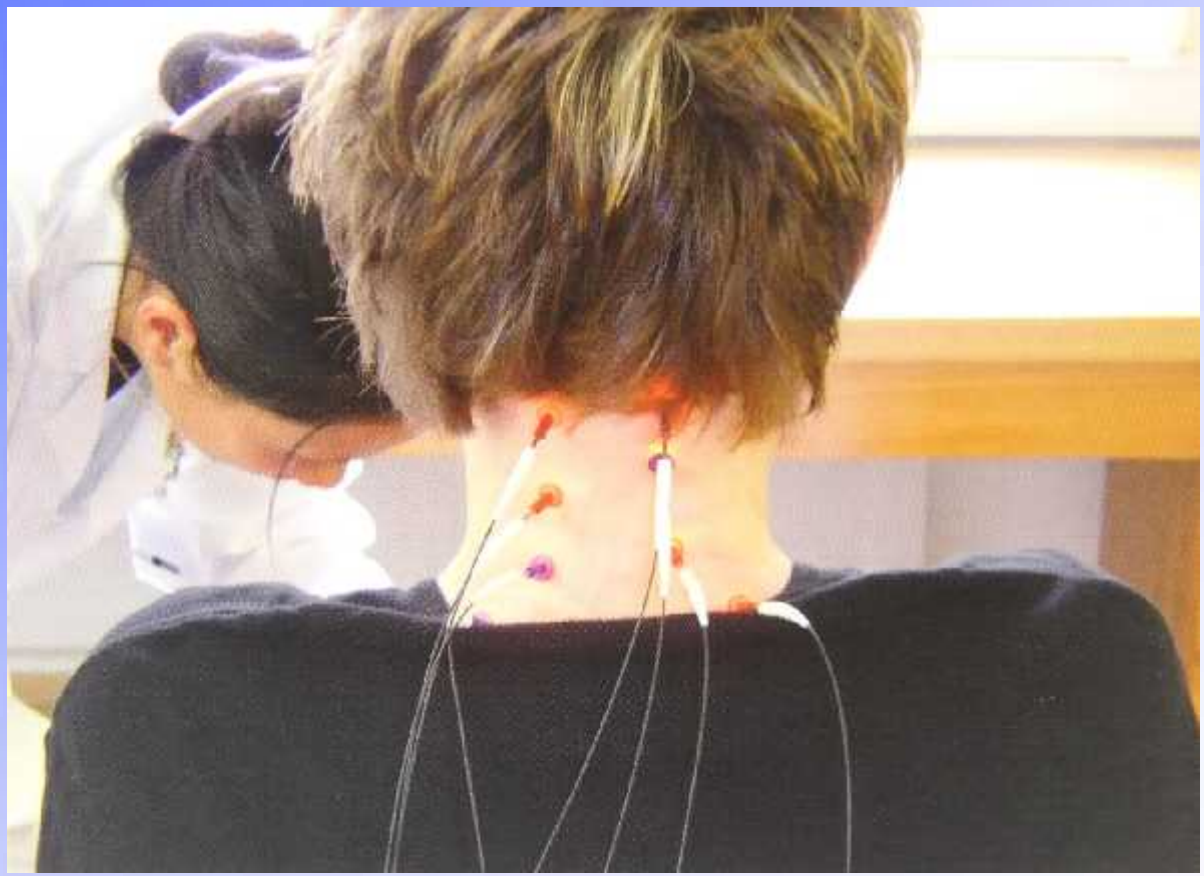
Knee osteoarthritis



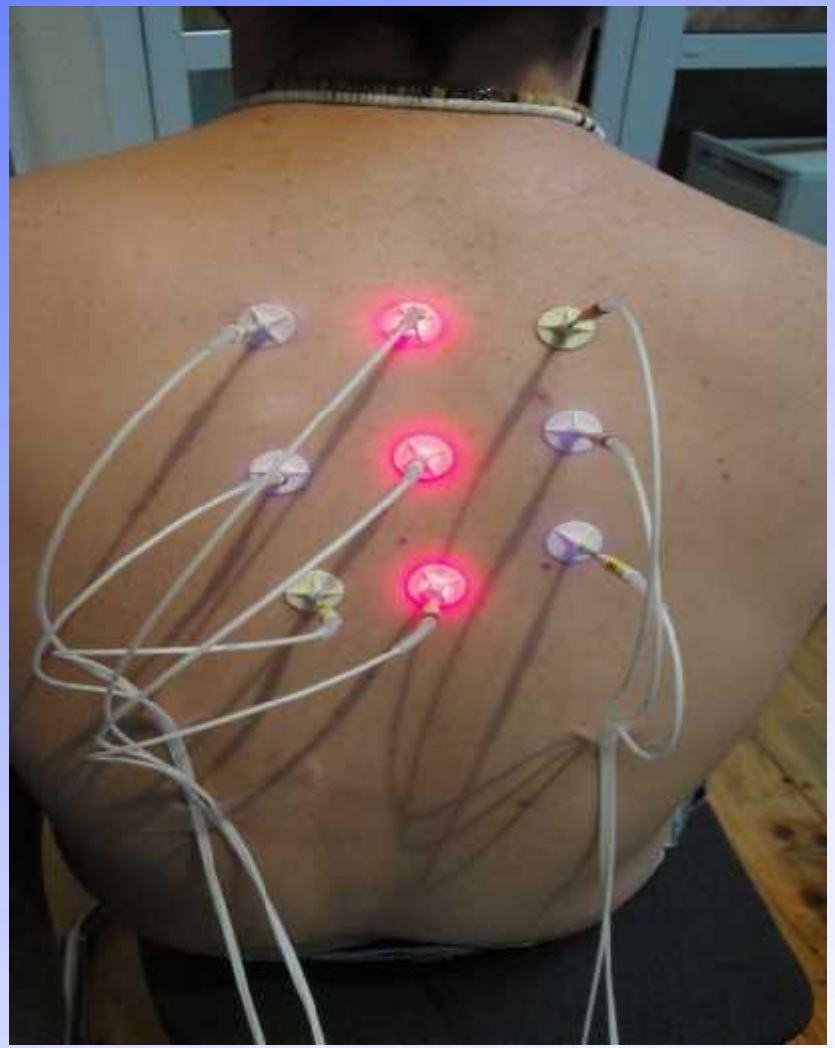
Knee osteoarthritis

Cervical spine syndrome

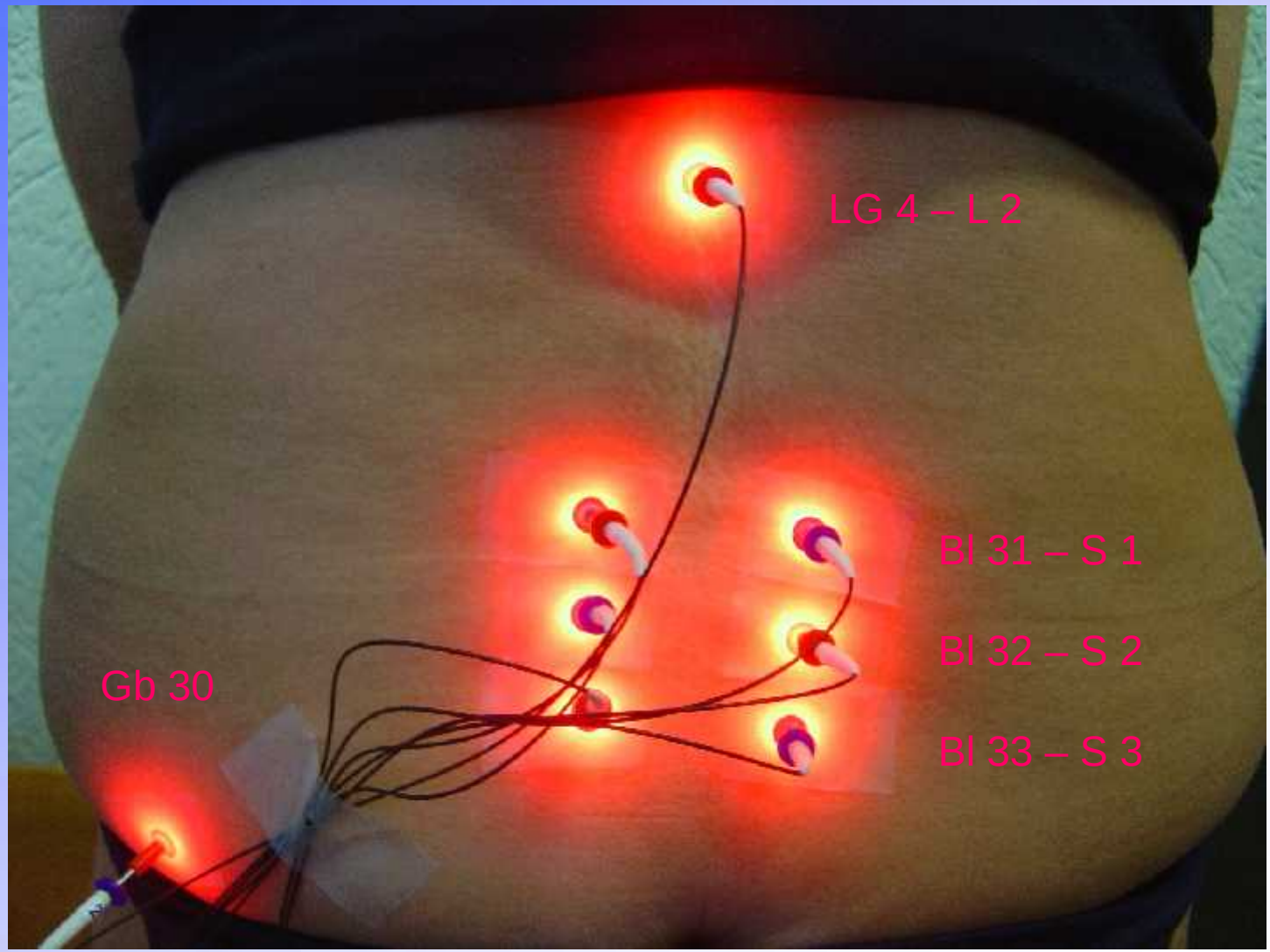
Cervical spine syndrome



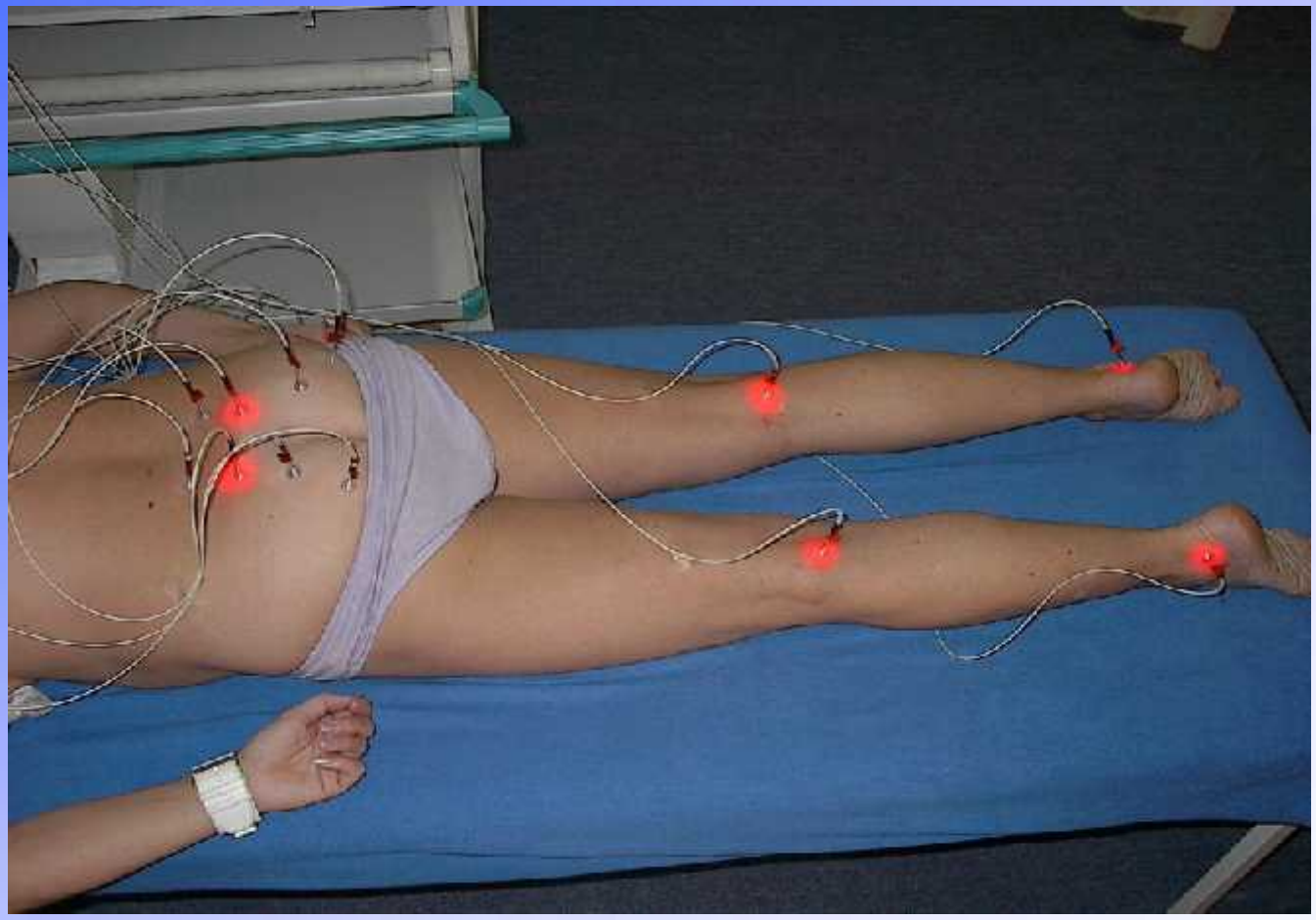
Thoracical spine syndrome



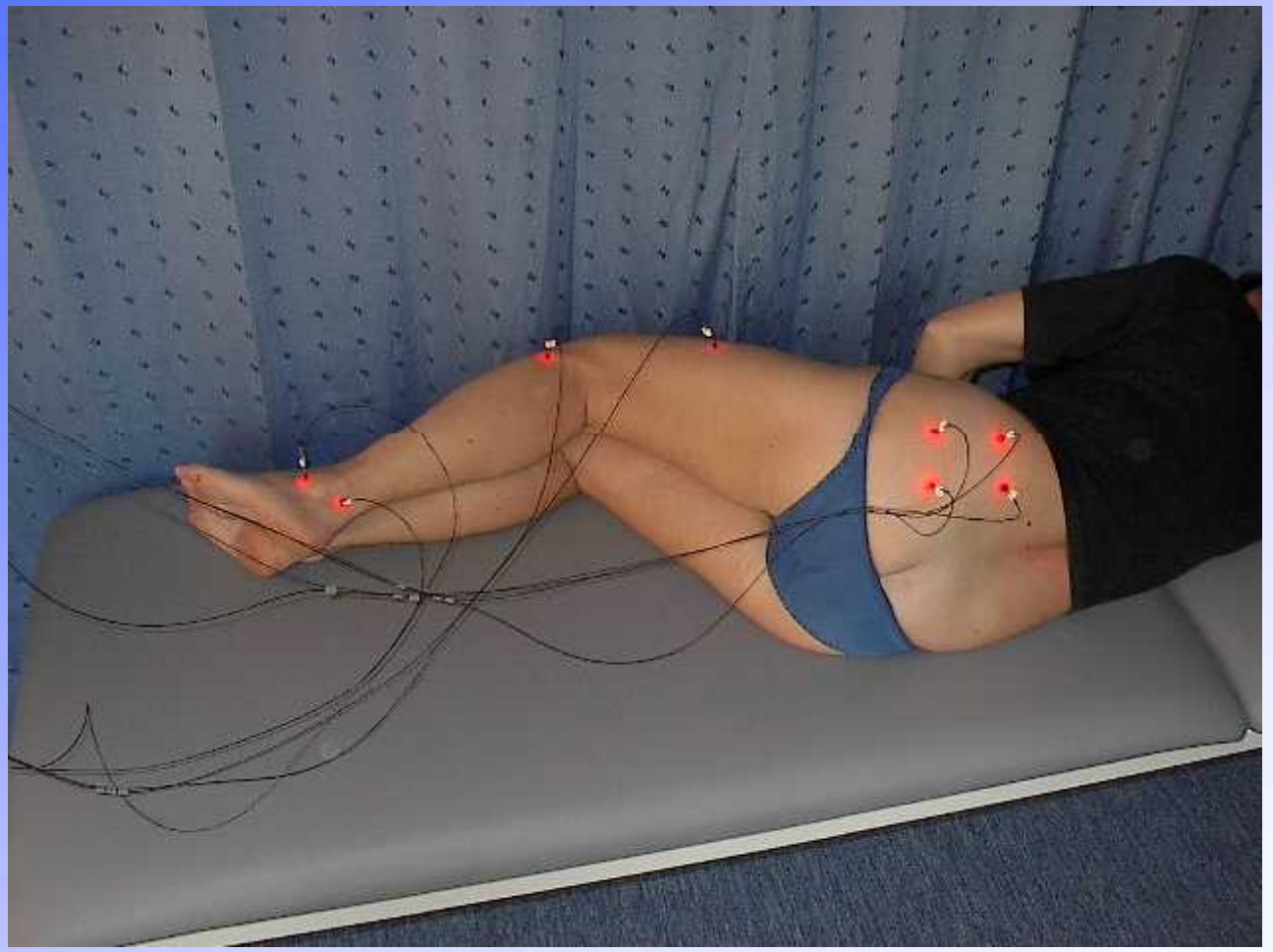
Lumbar spine syndrome



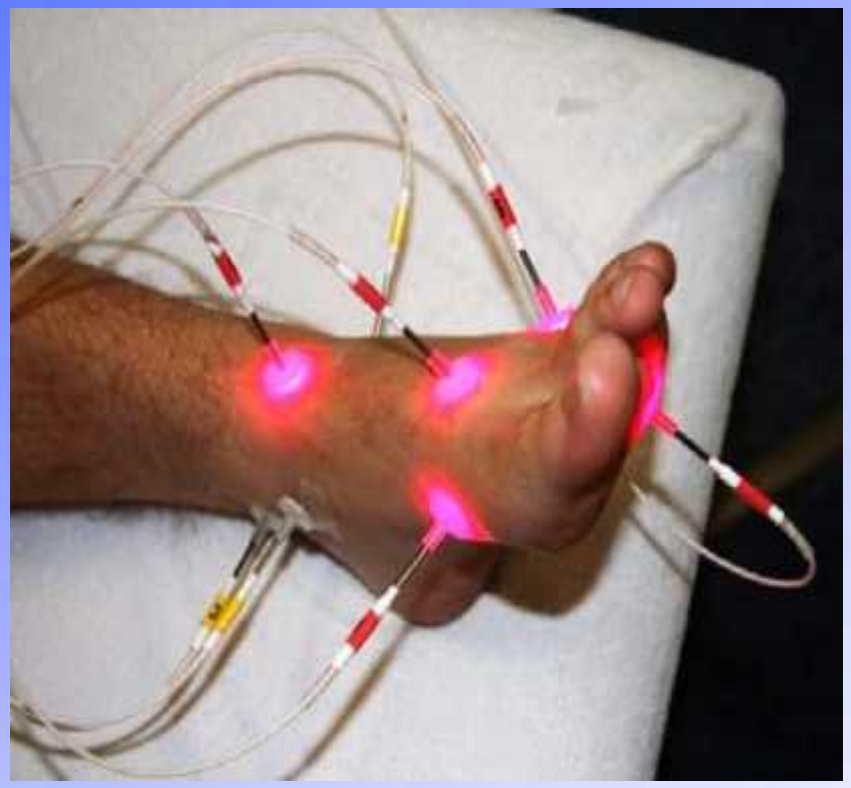
Lumbar spine syndrome



Hip osteoarthritis



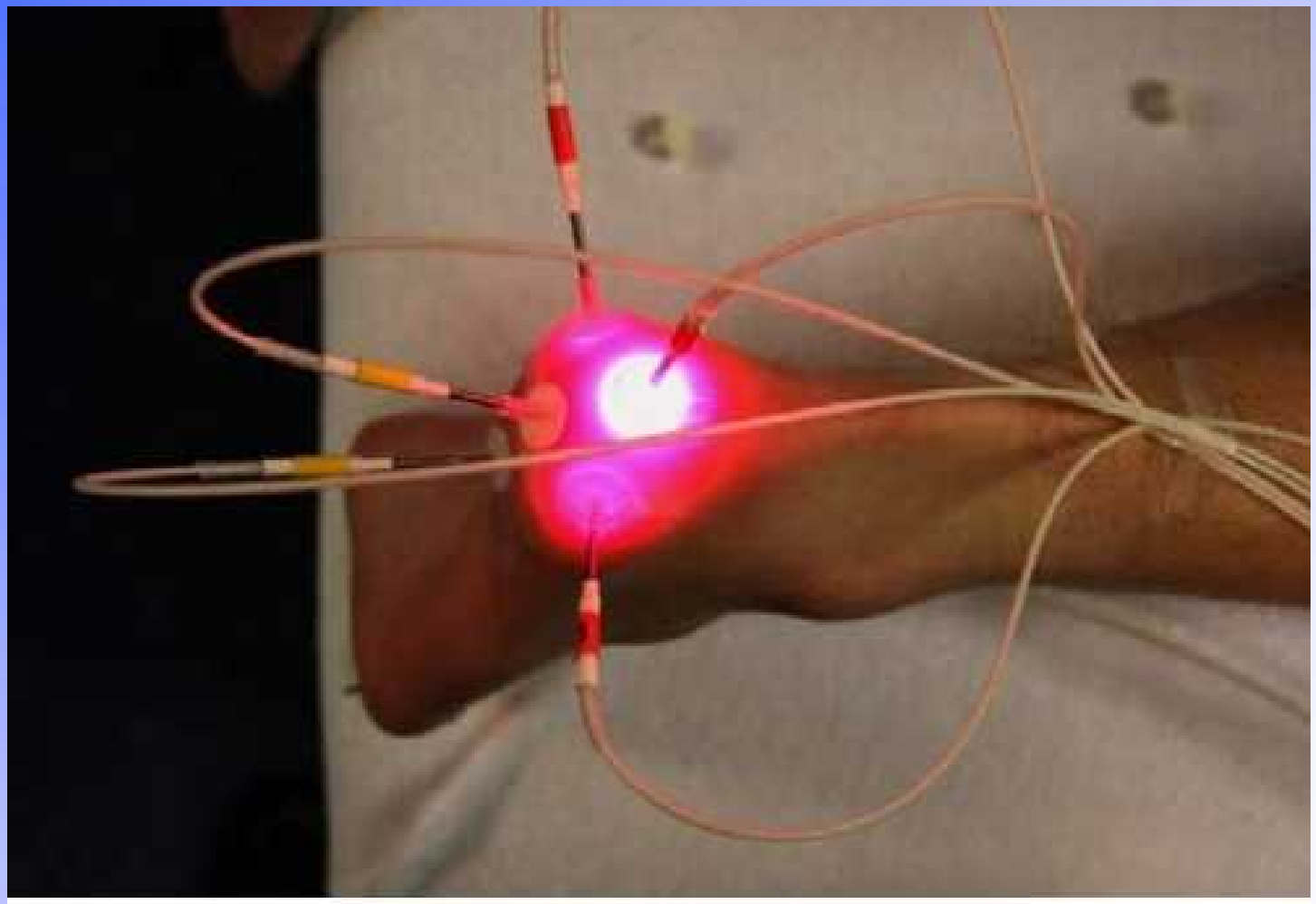
Laserneedle therapy of ancle joint osteoarthritis



Use pain points and
points all around the
Joint
Use red, infrared and green
(20 min, 50-100%)

(acupuncturists use Ki1 and
6, St 40, Sp 4 and 6, Bl 60
and Gbl 40)

Treatment of calcaneus pain



Calcaneal spur

Treatment of children (bronchial asthma)

Treatment of children (bronchial asthma)

Abdominal pain

Abdominal pain

Treatment of children, pylorospasm

Acupuncture in children with pylorus spasm

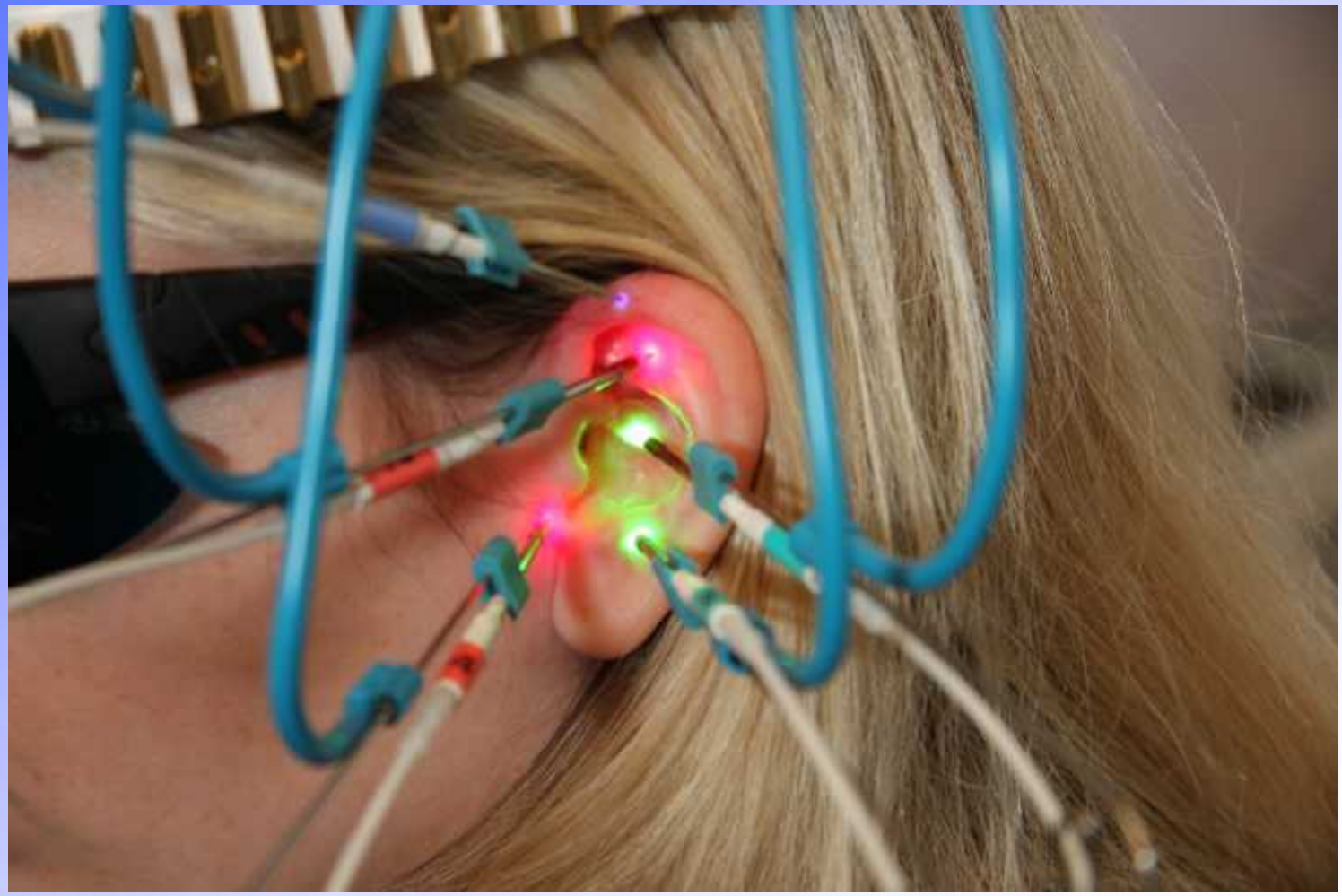
Preparation of birth in pregnancy

Ear acupuncture with laserneedles

Ohrakupunktur mit weberneedle Kopfadapter

Ear acupuncture with laserneedles

Battlefield Accupuncture, Dr. R. Niemtzow



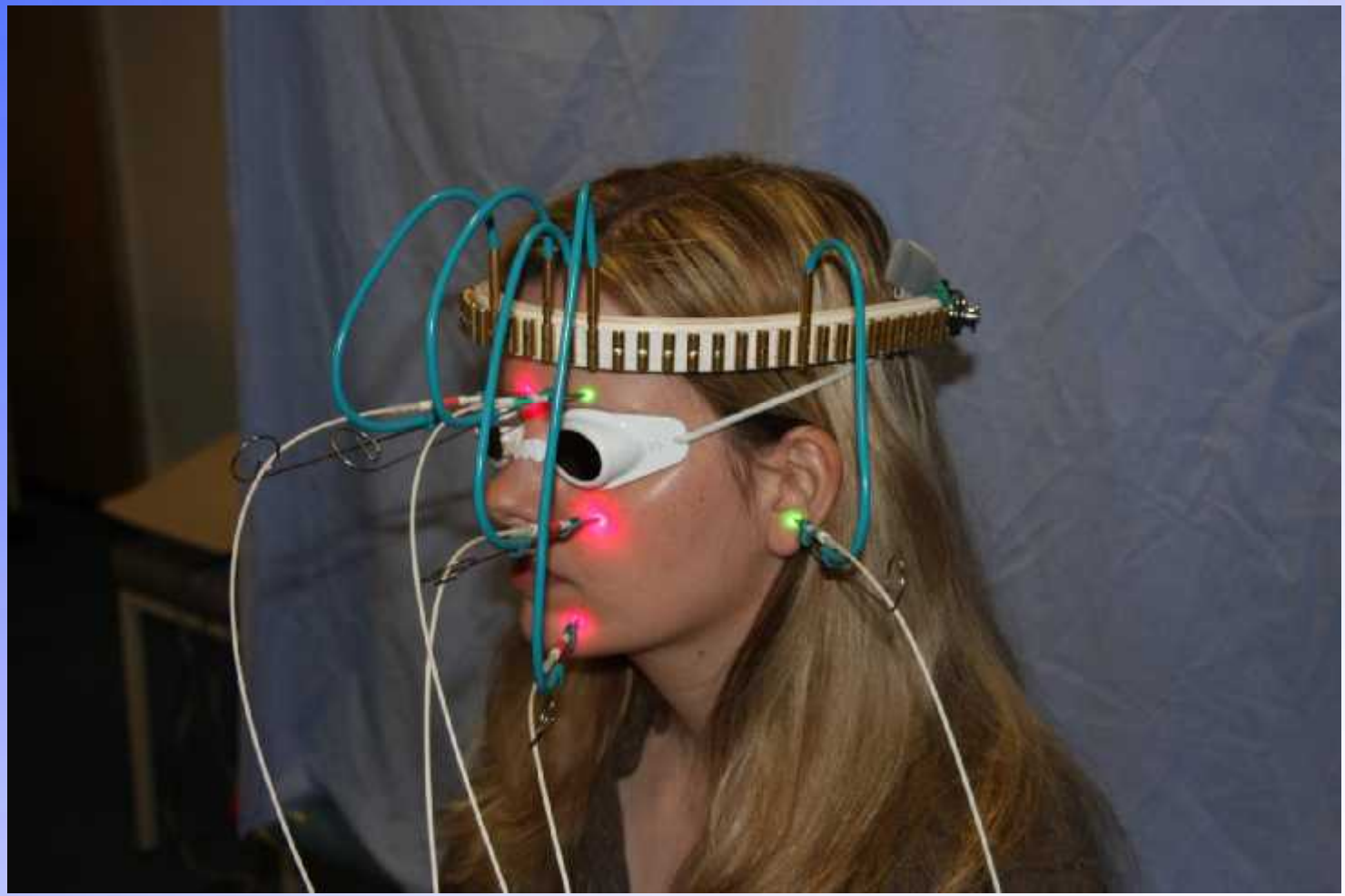
New headset für ear acupuncture

Laserclinic Dr. med. Dipl. chem.
Michael Weber, Germany

New headset für ear acupuncture

Skull and facial acupuncture with laserneedles

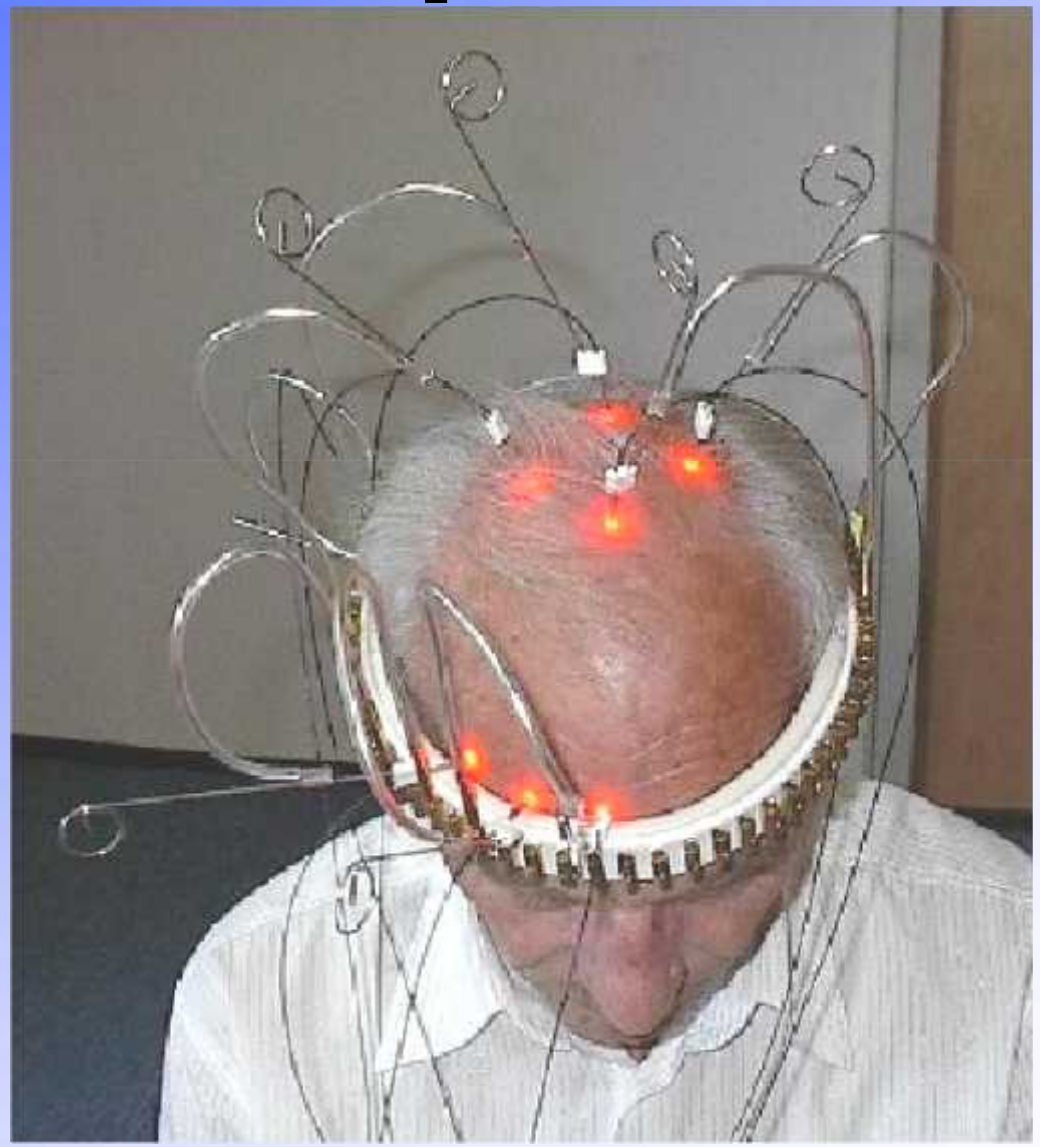
Facial trigeminal nerve acupuncture



Facial acupuncture with laserneedles

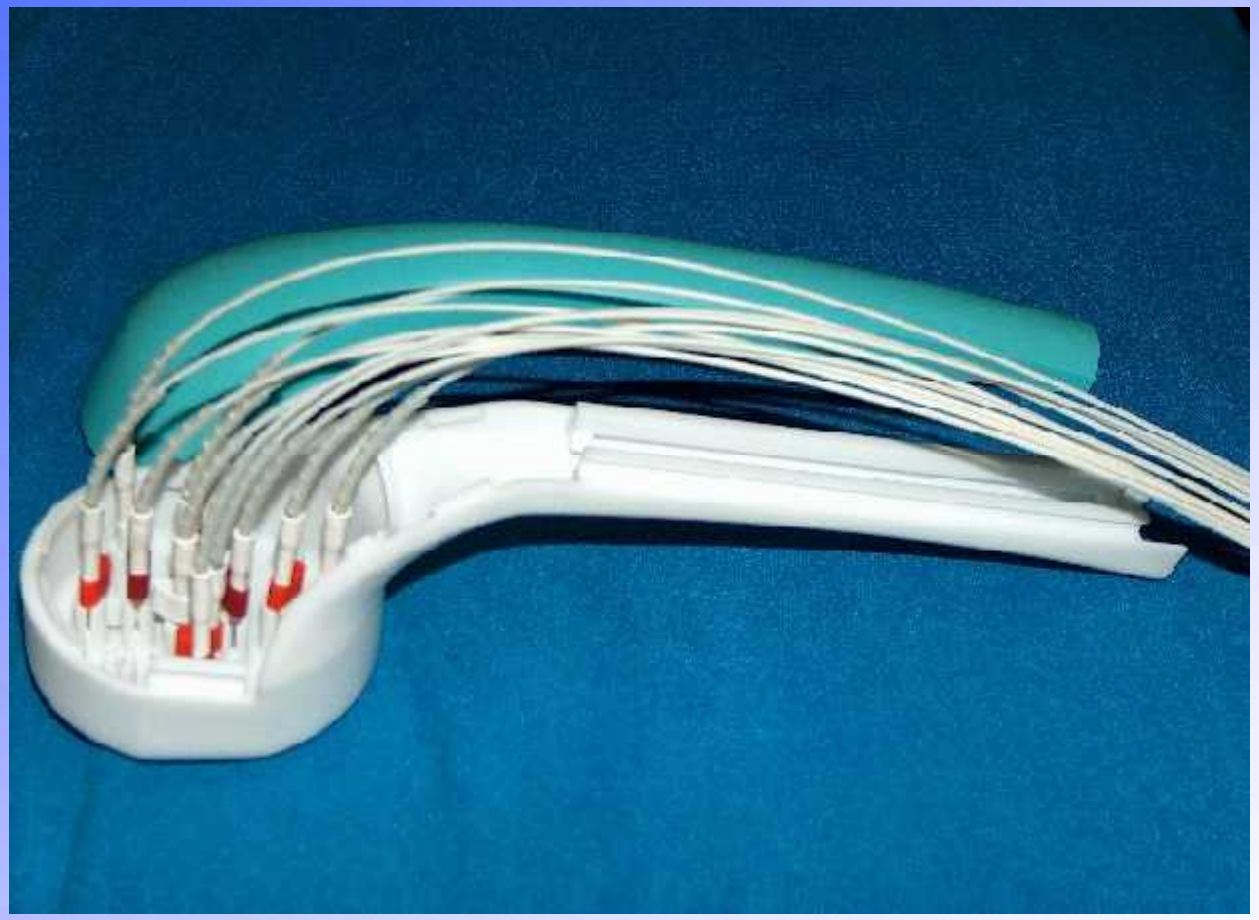
Laserclinic Dr. med.
Dipl. chem. Michael
Weber, Germany

Transcranial laser therapy, skull acupuncture



Transcranial laser therapy for stroke and brain diseases

The Laser body shower



Insertion of laser-needles with different wavelengths into a special shower head

Laserneedle body shower

Laserclinic Dr. med. Dipl. chem.
Michael Weber, Germany

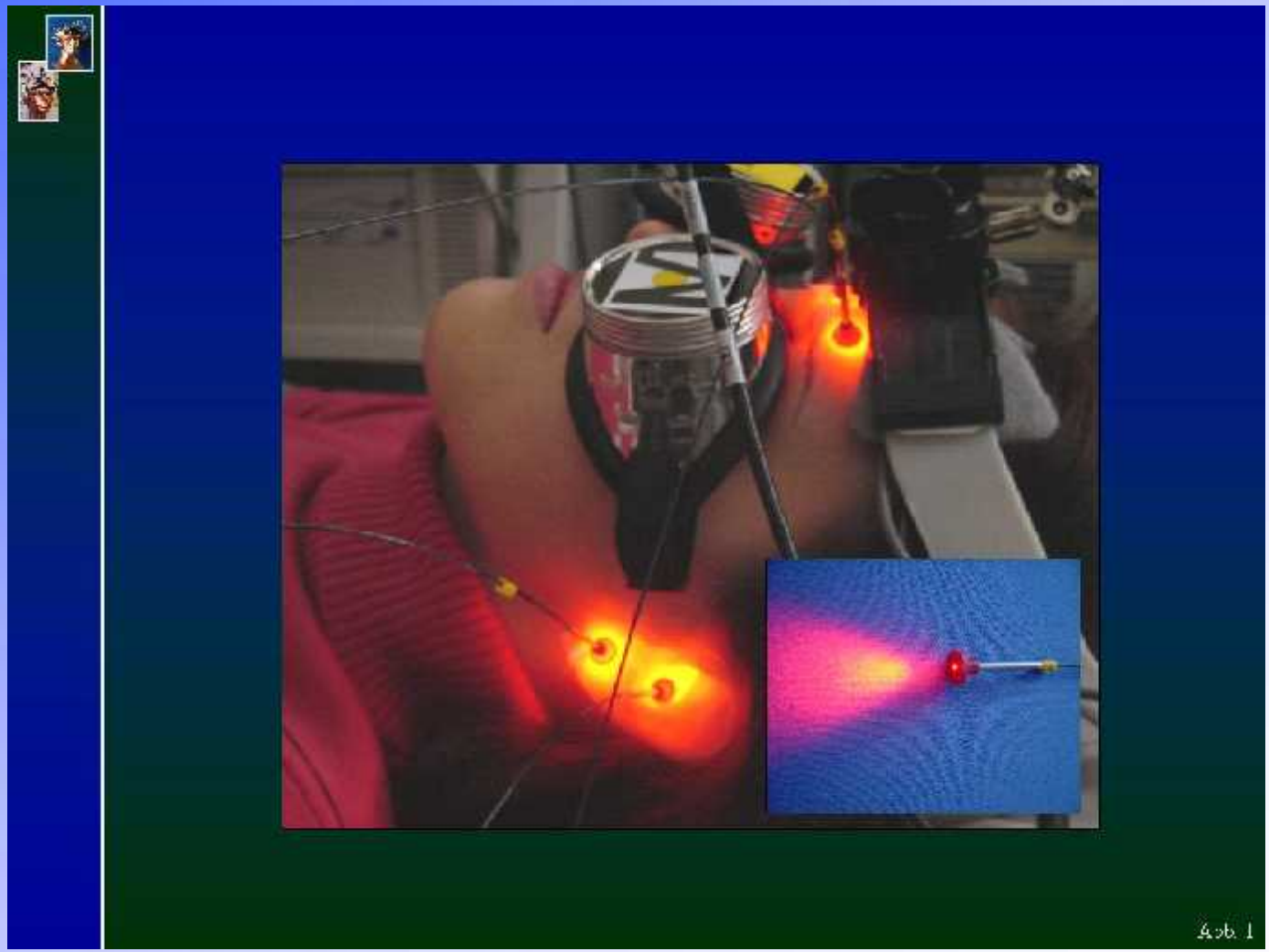
The Laser body shower

Laser small shower (mouth shower)

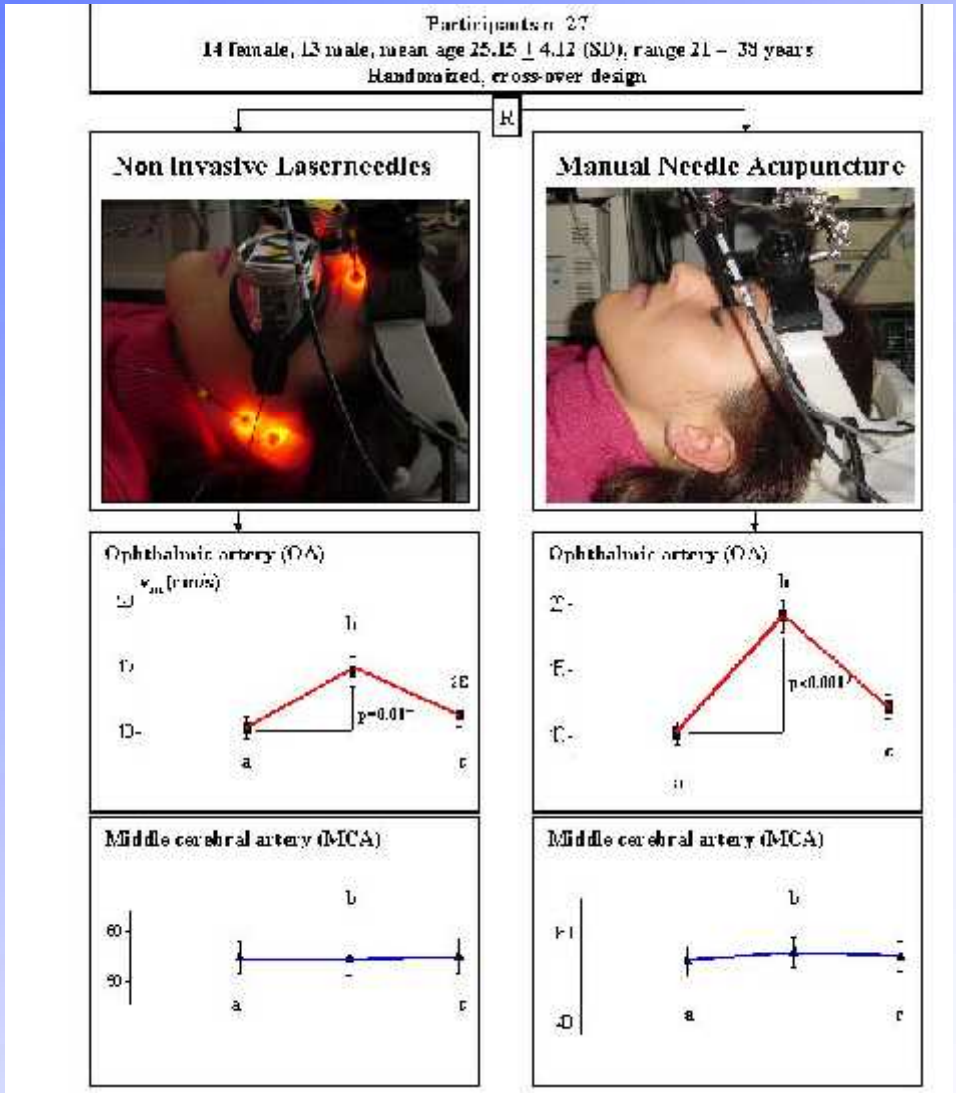
Clinical Studies

Measurement of blood flow rate in the A. ophthalmica after laserneedle acupuncture

(Professor Litscher, University Graz)



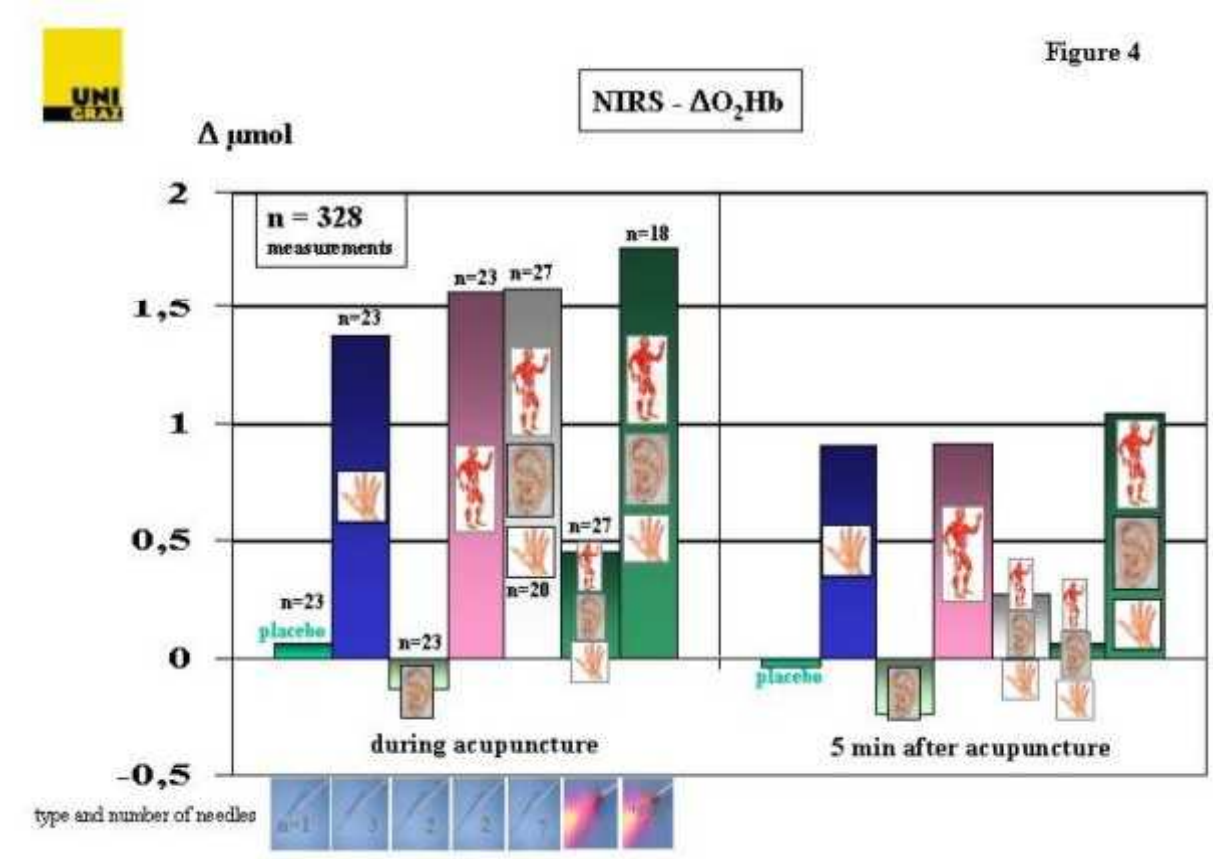
Measurement of blood flow rate in the A. ophthalmica after laserneedle acupuncture (Professor Litscher, University Graz)



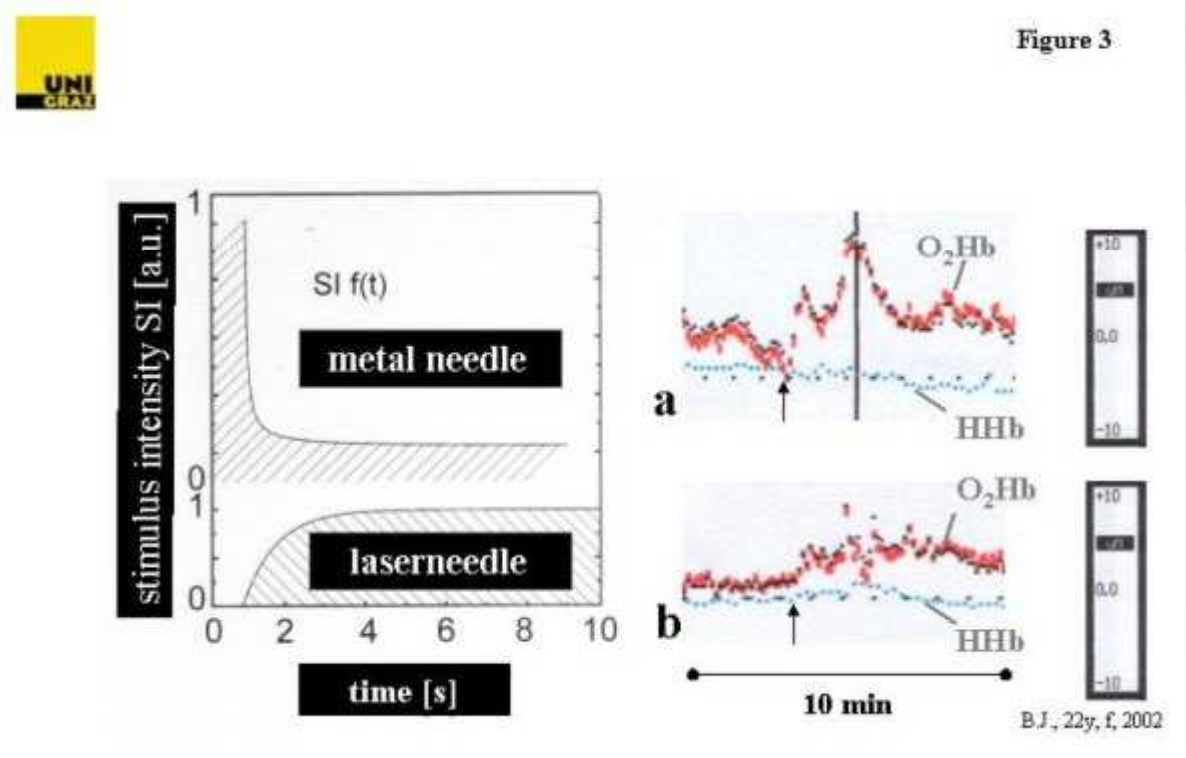
- **Litscher** G., L. Wang, E. Huber:
- **Cerebral changes measured with near infrared spectroscopy using laserneedle acupuncture**

- Biomed. Technik. (2002), 47: 76-79.

Laserneedle near infrared spectroscopy



Laserneedle comparison to metal needle



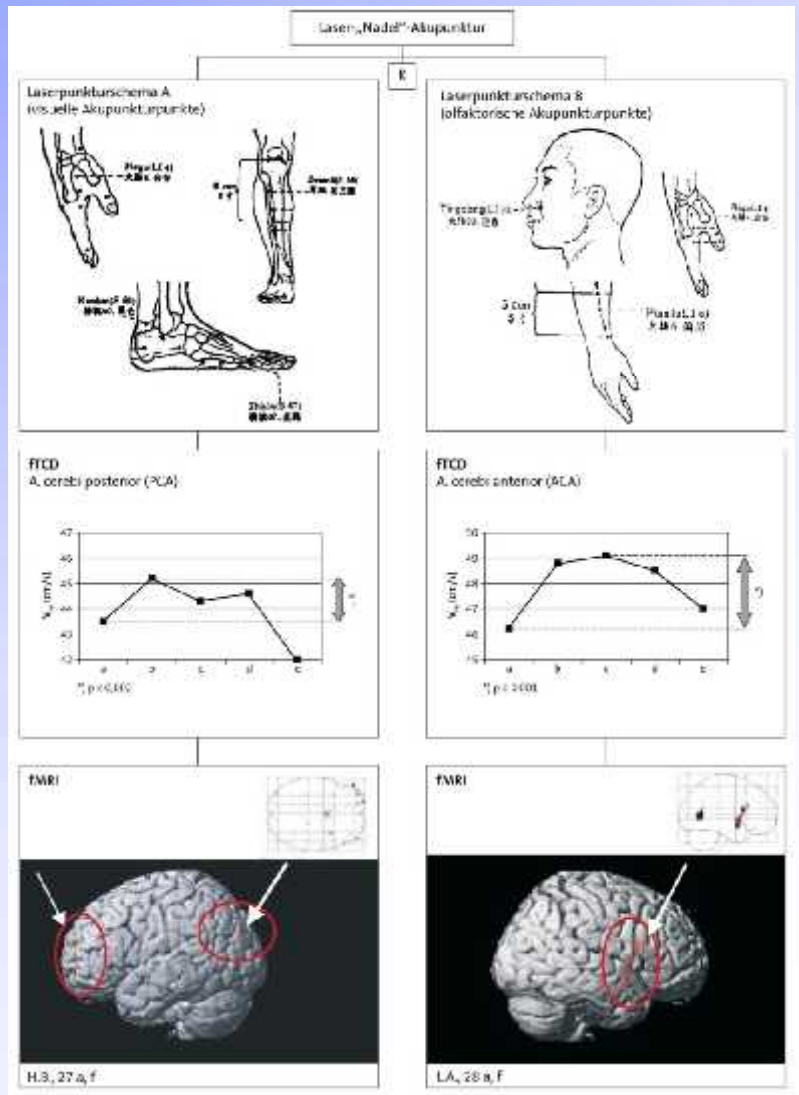
- **Acupuncture using laser needles modulates brain function: first evidence from functional transcranial Doppler sonography and functional magnetic resonance imaging.**

- Litscher G, Rachbauer D, Ropele S, Wang L, Schikora D, Fazekas F, Ebner F.
- Department of Biomedical Engineering and Research in Anesthesia and Critical Care, Medical University of Graz, Auenbruggerplatz 29, 8036, Austria. gerhard.litscher@meduni-graz.at

Laser needle acupuncture modulates brain activity

G. LITSCHER, D. RAUCHBAUER, S. ROPELE, L. WANG, D. SCHIKORA

Abb. 1: Erstes funktionelles Magnetresonanzimaging (fMRI) während Laser-„Nadel"-Stimulation von visuellen Akupunkturfernpunkten bei einer 27 Jahre alten Probandin an der Universität Graz.



The official journal of the American Acadamy of Medical Acupuncture

Issue No. 19, Sep 2007

Pain relief of laserneedle acupuncture in 1500 patients

Weber et. al. 2007

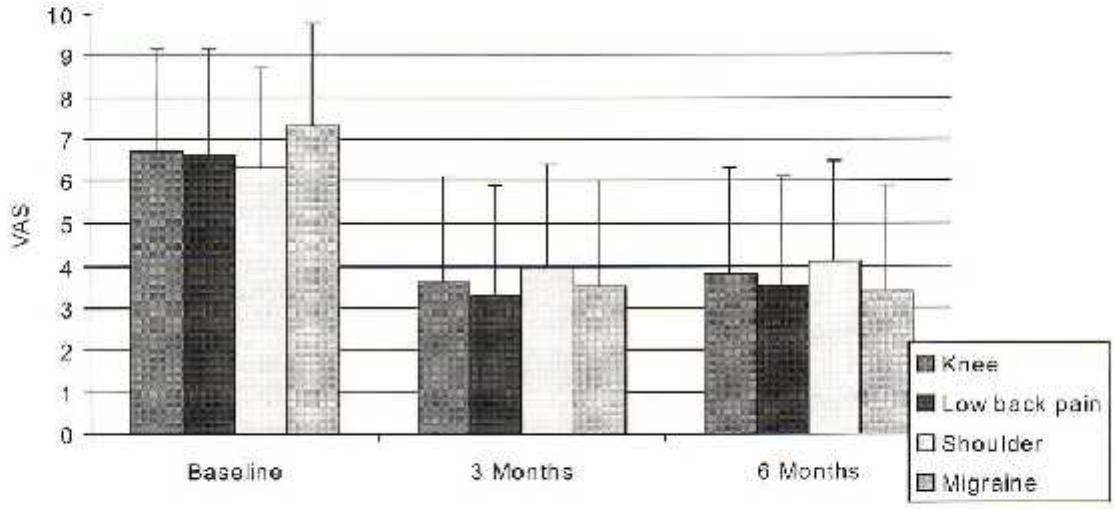


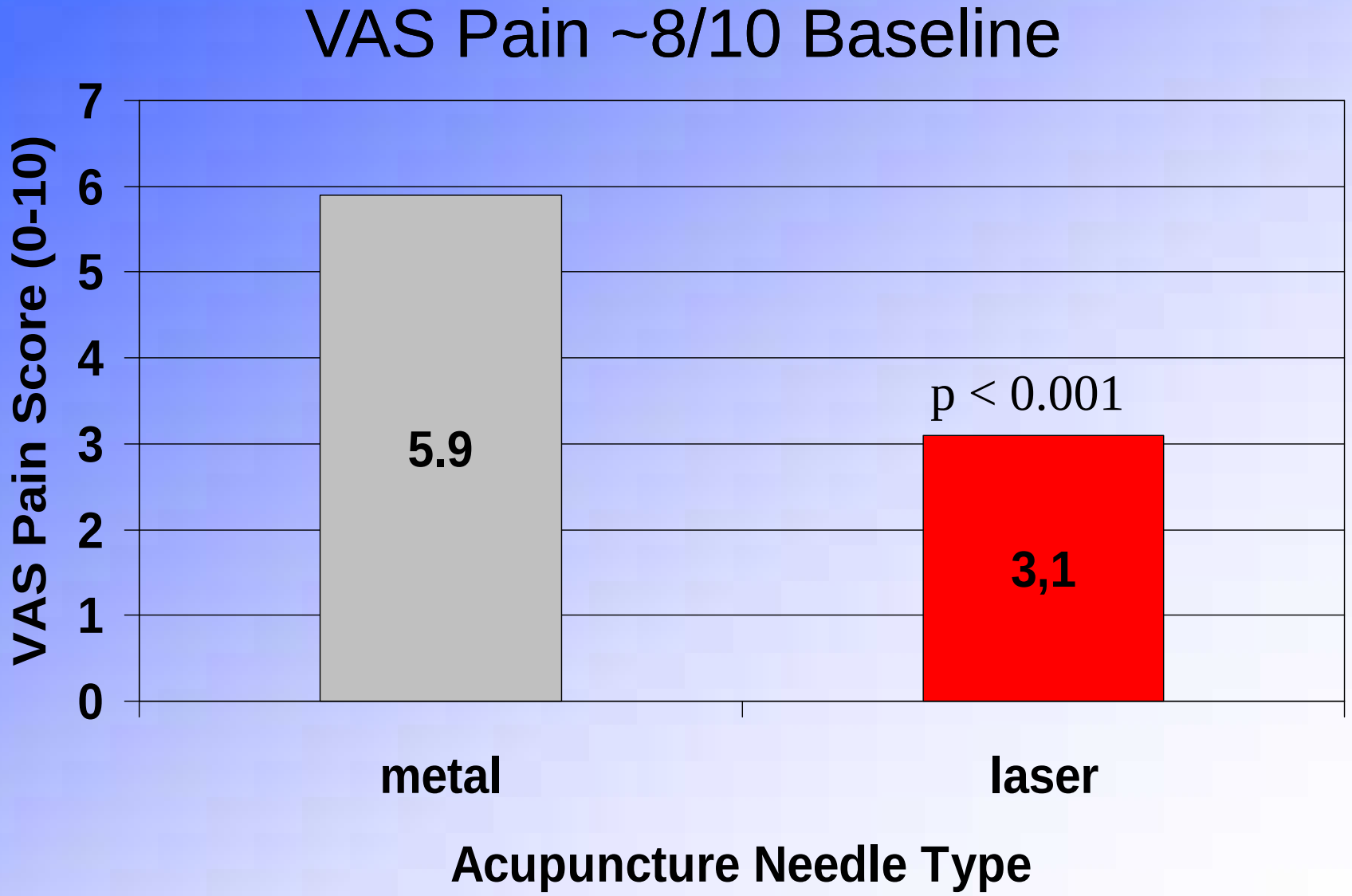
FIG. 10. Pain relief after treatment of 4 different pain syndromes 3-6 months later. VAS indicates visual analog scale. (This group of patients treated with laser needle acupuncture only.)

- Original Paper
- **Pilot Study of the Clinical Equivalence of Laser Needle to**
- **Metal Acupuncture Needle in Treating Musculoskeletal Pain**

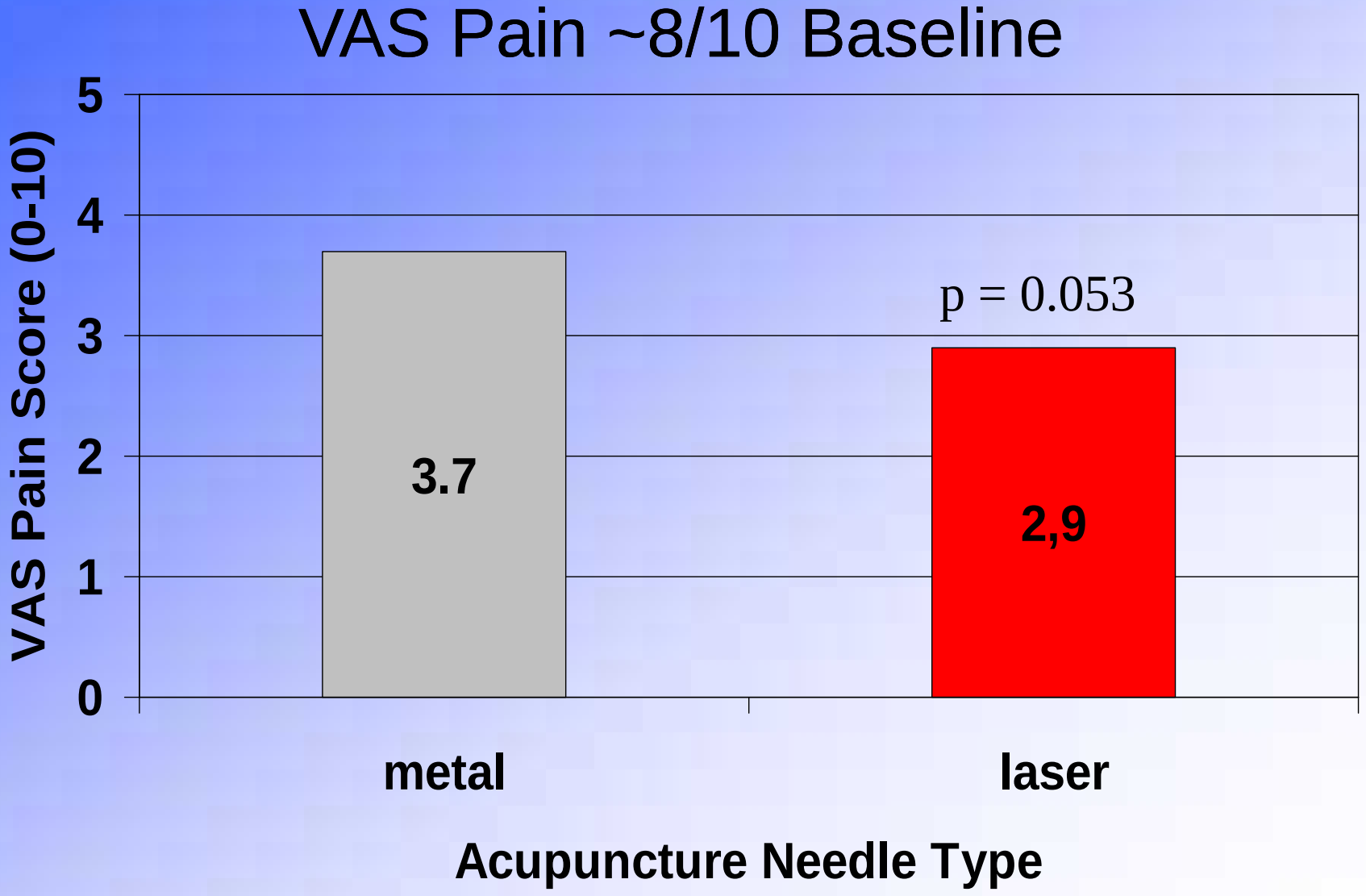
Peter T Dorsher MS, MD
Mayo Clinic Florida
4500 San Pablo Road
Jacksonville, Florida 32224
phone: 904-953-2823
fax: 904-953-0276
email: dorsher.peter@mayo.edu
abstract 267 words
text: 1985 without references, tables, and legends
figures: 3
tables: 4

Mayo Clinic Jacksonville

Results: Knee & Shoulder Arthritis



Results: Cervical & Lumbar Pain



Comparison between red and infrared laser: **Infrared laser can penetrate bones**

Bild 8: Rotes Laserlicht wird im Gewebe gestreut, teilweise absorbiert, aber auch an absorbierenden Strukturen (Knochen) vorbeigeleitet. Hier wird ein Finger von einem 250 mW starken roten Laser (660 nm), und einem 400 mW starken IR Laser (830 nm) bestrahlt. In der Handfläche ist kaum rote, wohl aber etwas IR Transmission sichtbar. Mit einem empfindlichen Messgerät liegt eine jeweilig emittierte Leistung bei etwa 0,002 mW/mm² (Finger rot), 0,012 mW/mm² (Finger IR), 0,00001 mW/mm² (Hand rot) und 0,0004 mW/mm2 (Hand IR). Die IR Bilder sind mit einer Sony HDR-SR1E im (unbeleuchteten) Night-Shot Modus aufgenommen, die roten Bilder auch mit einer Sony DSC-H1. Hier erscheint elektronisch bedingt ein besonders helles rotes Licht orange bis gelblich.

Photomedicine and Laser Surgery
Volume 26, Number 4, 2008

Pp. 301–306
DOI: 10.1089/pho.2007.2188

Laser-Needle Therapy for Spontaneous Osteonecrosis of the Knee

Winfried Banzer, M.D., Ph.D.,[1] Markus Hübscher, Ph.D.,[1] and Detlef Schikora, Ph.D.[2]

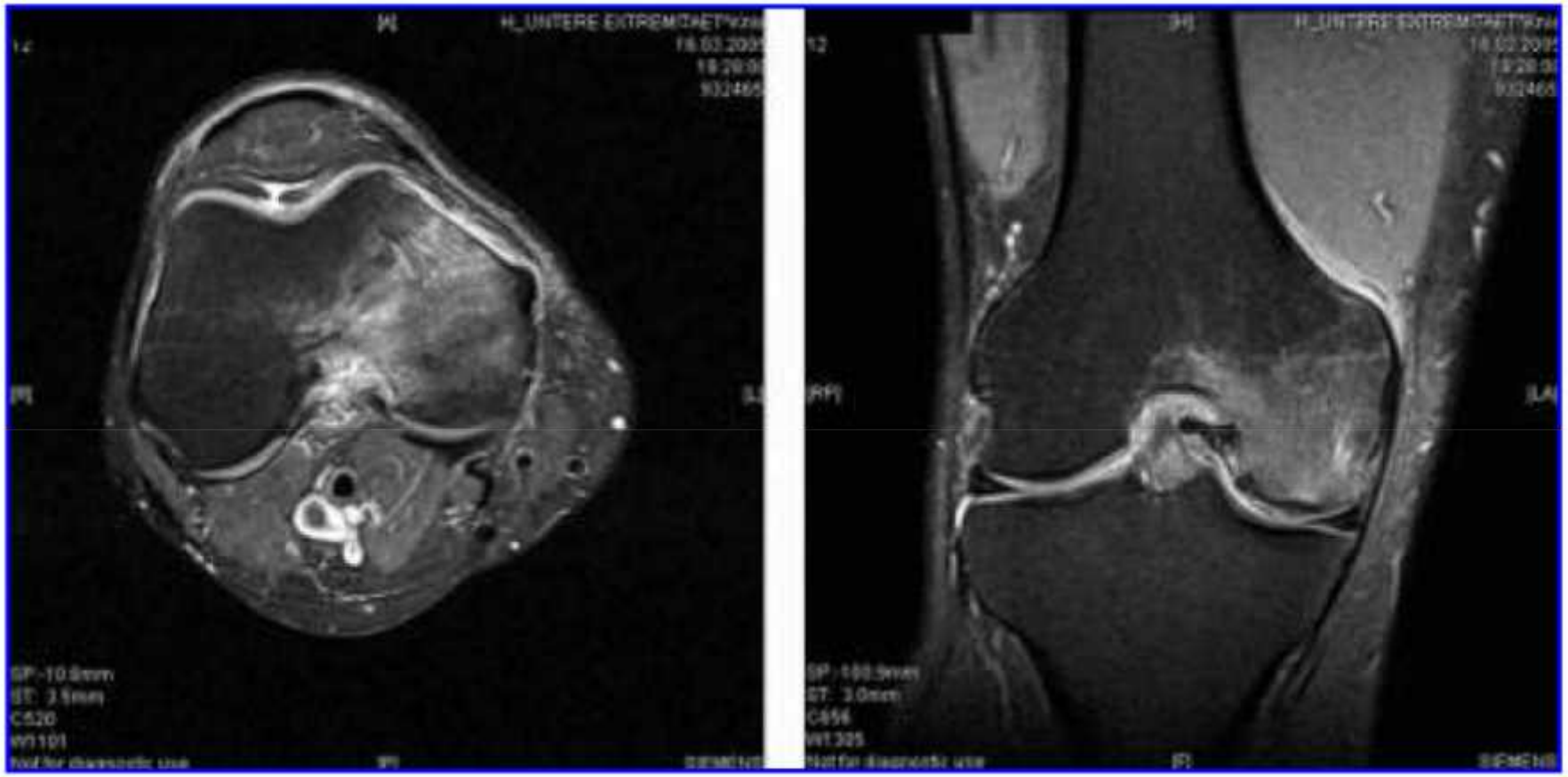


FIG. 1. These MRI images, made March 16, 2005, are a coronary fat-suppressed PD TSE sequence. (**A**) Axial and (**B**) frontal images, showing a linearly subcortical focus at the medial femur condyle with adjacent spongiosa edema (necrotic zone) reaching deep into the bone marrow.

FIG. 2. These MRI images, made on April 25, 2005, are a coronary fat-suppressed PD TSE sequence. (A) Axial and (B) frontal images, demonstrating distinct regression of the spongiosa edema at the medial femur, as well as a decrease in size of the subcortical focus.

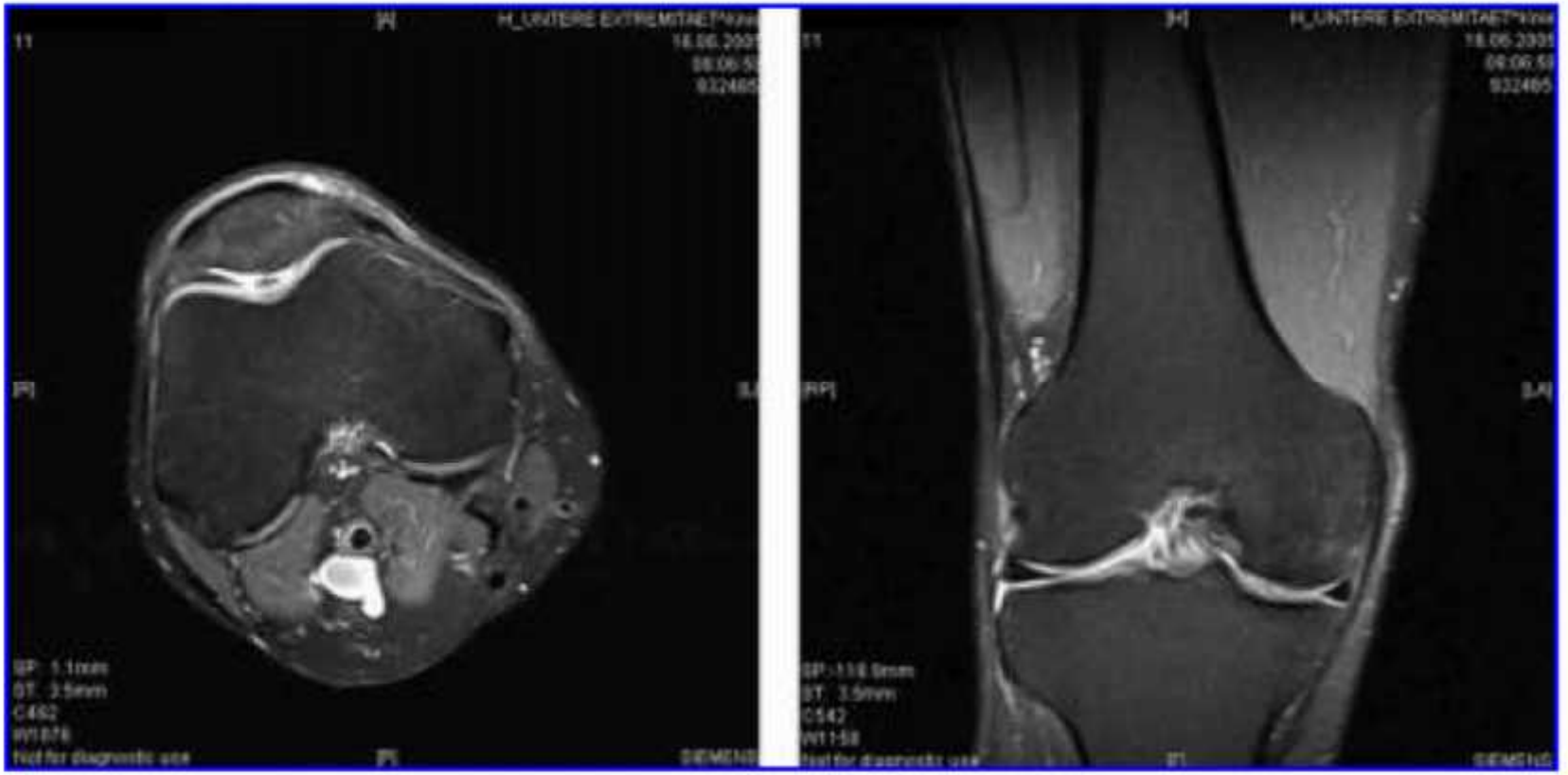
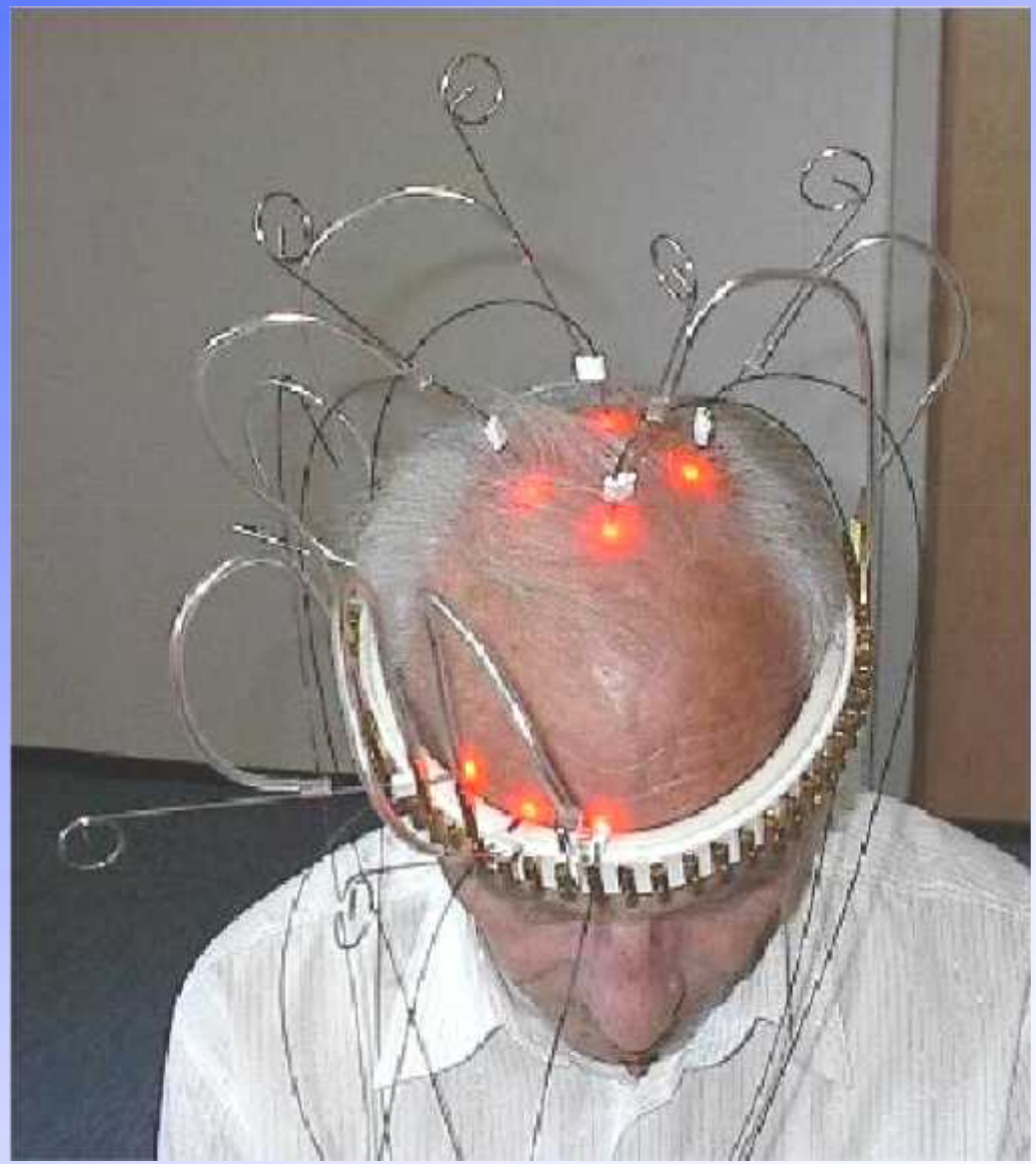


FIG. 3. These MRI images, made on June 16, 2005, are a coronary fat-suppressed PD TSE sequence. (**A**) Axial and (**B**) frontal images, showing almost complete restitution of the spongiosa edema.

Transcranial laser therapy



Transcranial laser therapy

Infrared Laser Therapy for Ischemic Stroke: A New Treatment Strategy

Results of the NeuroThera Effectiveness and Safety Trial–1 (NEST-1)

Yair Lampl, MD; Justin A. Zivin, MD, PhD; Marc Fisher, MD; Robert Lew, PhD; Lennart Welin, MD; Bjorn Dahlof, MD; Peter Borenstein, MD; Bjorn Andersson, MD; Julio Perez, MD; Cesar Caparo, MD; Sanja Ilic, MD, MS; Uri Oron, PhD

Background and Purpose—The NeuroThera Effectiveness and Safety Trial–1 (NEST-1) study evaluated the safety and preliminary effectiveness of the NeuroThera Laser System in the ability to improve 90-day outcomes in ischemic stroke patients treated within 24 hours from stroke onset. The NeuroThera Laser System therapeutic approach involves use of infrared laser technology and has shown significant and sustained beneficial effects in animal models of ischemic stroke.

Methods—This was a prospective, intention-to-treat, multicenter, international, double-blind, trial involving 120 ischemic stroke patients treated, randomized 2:1 ratio, with 79 patients in the active treatment group and 41 in the sham (placebo) control group. Only patients with baseline stroke severity measured by National Institutes of Health Stroke Scale (NIHSS) scores of 7 to 22 were included. Patients who received tissue plasminogen activator were excluded. Outcome measures were the patients' scores on the NIHSS, modified Rankin Scale (mRS), Barthel Index, and Glasgow Outcome

MRI-research institute Prof. Cho, Incheon, Südkorea

First MRI, Los Angeles, Prof. Cho


SIEMENS

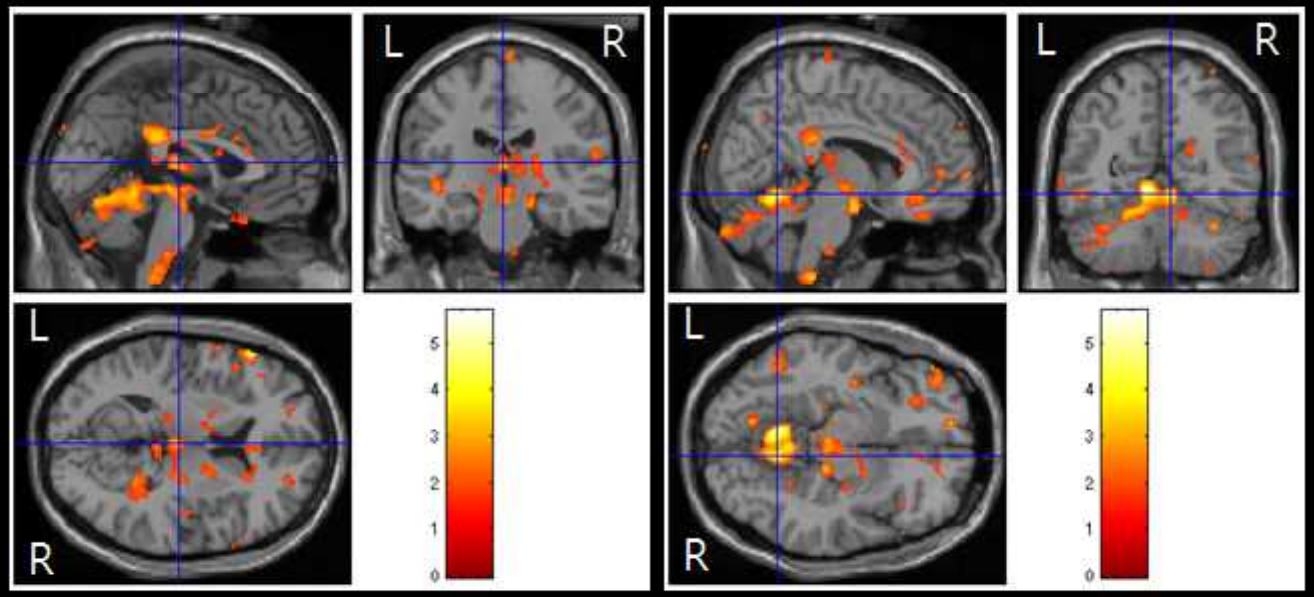
Laser Acupuncture

Intravascular + Head

2010-06-03

SUBJ2 Weber

P<0.05



Transcranial infrared laser (tILS) stimulation: Does it exert effects on the intact human brain?

Prof. Dr. Walter Paulus
Prof. Dr. Andrea Antal
Dr. Leila Chaieb
Department of Clinical Neurophysiology
University of Göttingen, Germany

UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

Introduction: What effects does laser light have on the brain?

Application of low level laser therapy (LLLT) for wound healing, inflammation and chronic pain relief has now widened to include neurological disorders such as stroke, neurodegenerative diseases and the treatment of traumatic brain disorders (Hashmi et al, 2010).

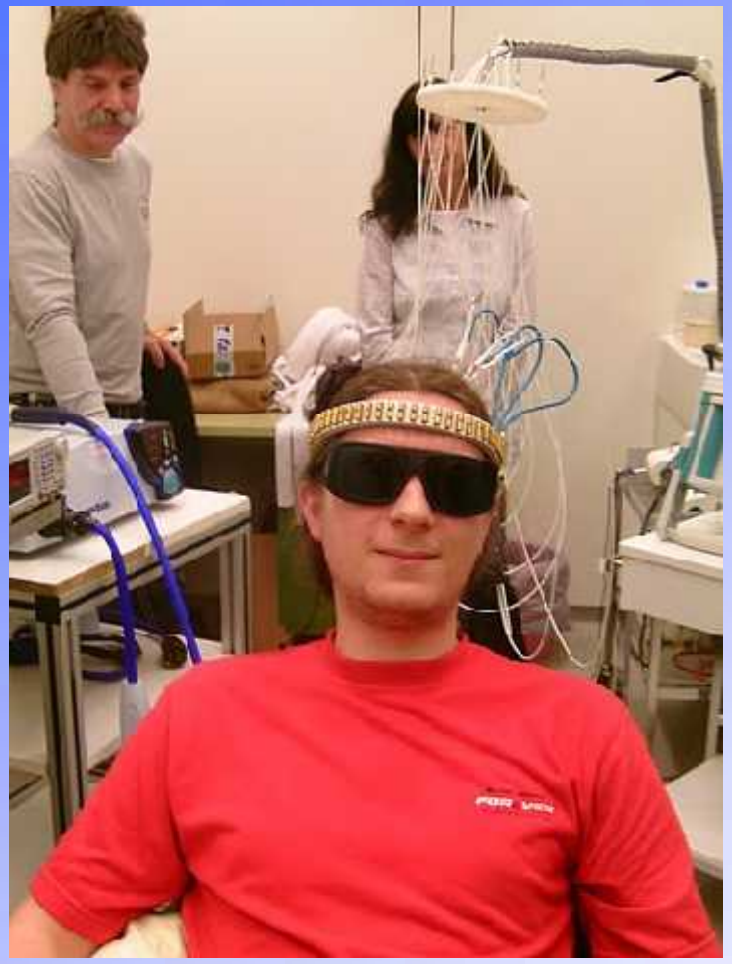
• **Stroke rehabilitation** Recent studies have shown that mice models of stroke treated 4 and 24hrs after 'stroke induction' had reduced cognitive deficits (Oron et al., 2006); a large multi-centre study has shown that infrared laser therapy 24hrs after stroke onset was safe to use for the treatment of ischaemic stroke (Lampl et al., 2007).

• **Alzheimer´s disease (AD)** A recent study has shown that a near-infrared irradiation of tumour cells (containing amyloid plaques like those in AD), significantly reduced the number of plaques in cells treated with laser stimulation and green tea extract (Sommer et al., 2011); numbers of amyloid plaques were also significantly reduced in a mouse model of AD when treated with transcranial laser therapy (TLT) (Taboada et al., 2011).

• **Traumatic brain injury (TBI)** Low level laser therapy applied to mice with induced TBI, significantly reduced long term neurological damage (Oron et al., 2007); case study of two patients showed that after a series of transcranial light therapy (TLT) in the near-infrared range, showed improved cognition (Naeseret al., 2011).

UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

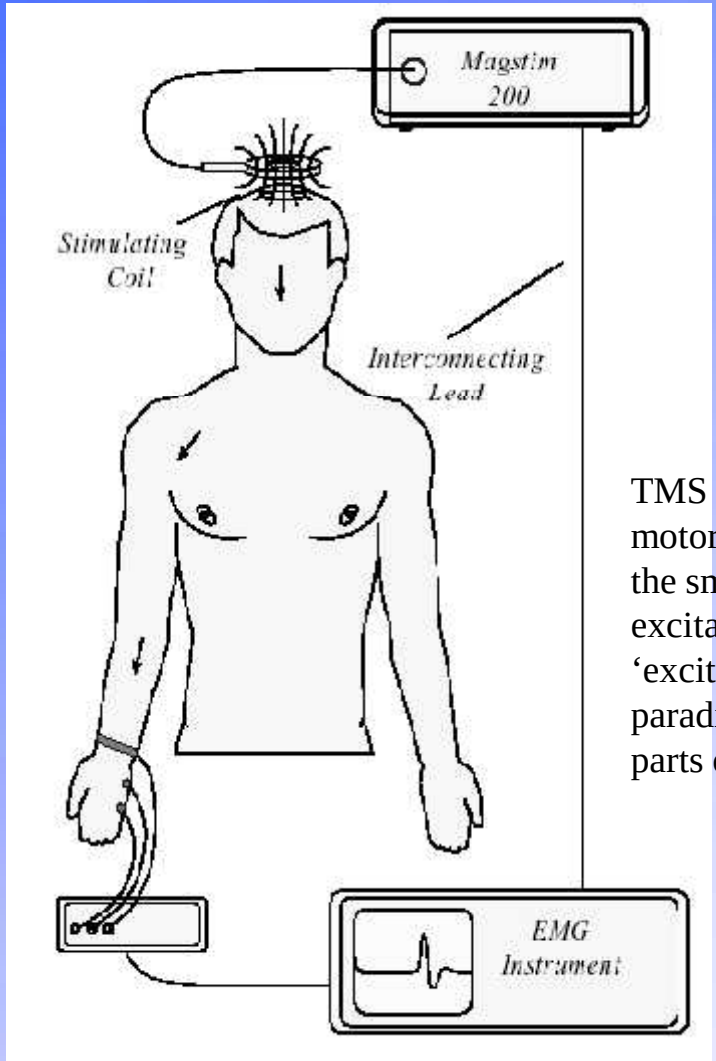
Measurements and tILS: setup



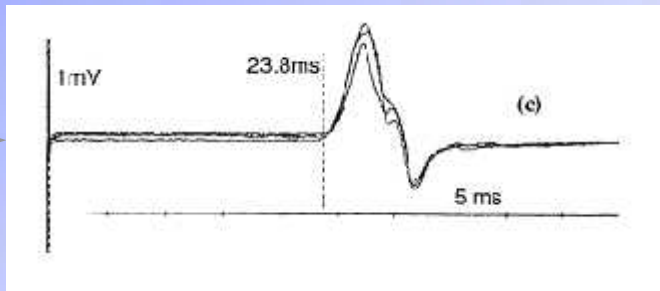
Photographs courtesy of Géza-Gergely Ambrus, MA,
Department of Clinical Neurophysiology, Göttingen

UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

Measurements and tILS: the Motor System



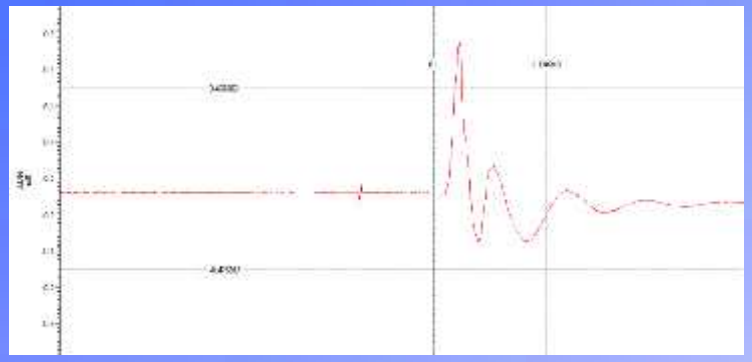
Motor-evoked-potential (MEP)



TMS induces a brief electric field in the brain allowing the generation of a motor-evoked-potential (MEP), which can be easily seen as a 'twitch' in the small hand muscle. This is a global measure of motor cortical excitability. The amplitude of the elicited MEPs can show us how 'excitable' the brain is before and after stimulation. Different TMS paradigms show us how laser light stimulation interacts with different parts of the intact brain and how it affects different cortical populations.

UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

Measurements and tILS: the Motor System

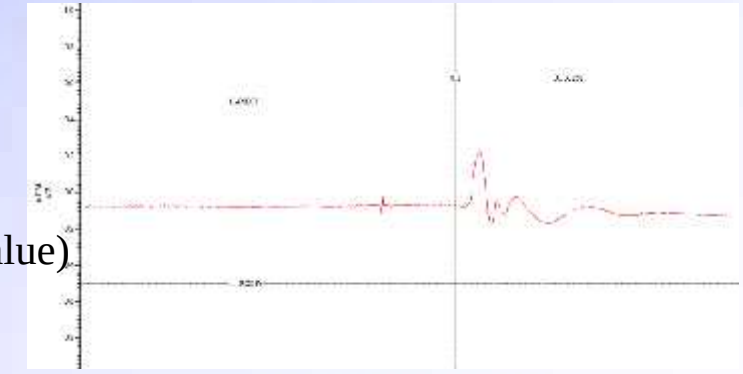


MEP BEFORE tIL stimulation

- MEP is averaged to 1 millivolt peak-to-peak

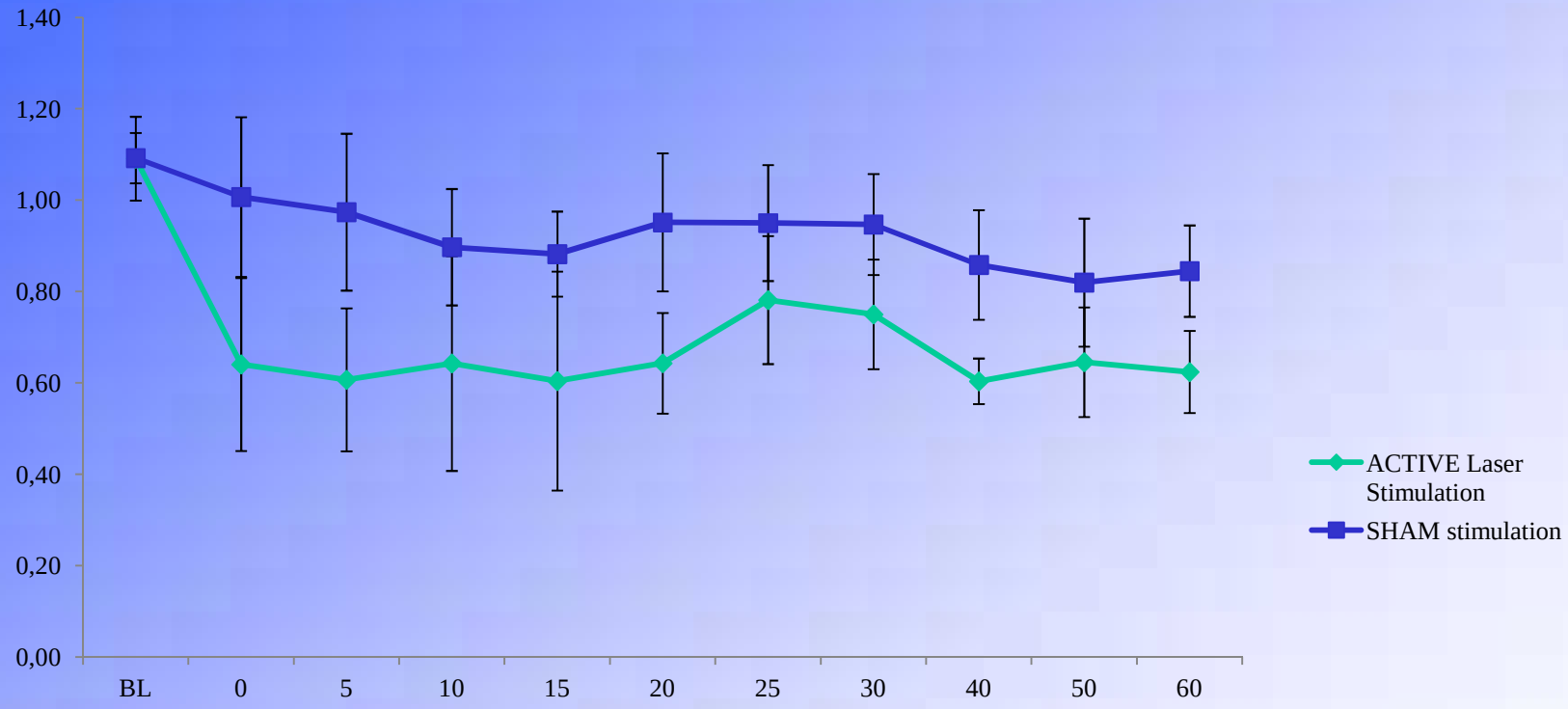
MEP AFTER tIL stimulation

- average MEP amplitude (peak-to-peak value) is decreased. MEP is become smaller



UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

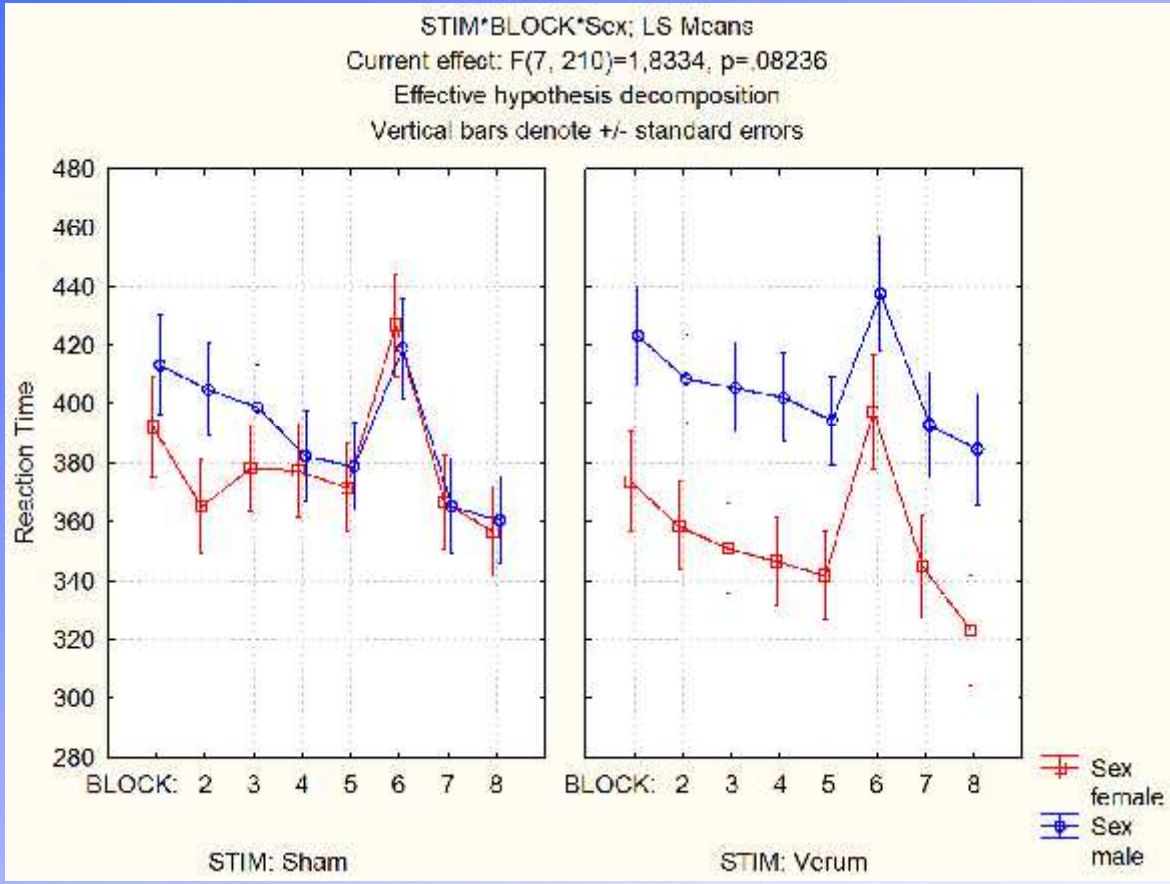
Preliminary results



Specifications: Laser light was applied for 10mins over the primary motor cortex; a configuration of 4 needles was used. Data is derived from 17 healthy participants. Sham (or placebo) stimulation was also applied, but indicates 'stimulation' without laser light.

UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

Preliminary results: In the Visuomotor System



Here again we can see the tendency towards better performance by female participants in the SRTT during tIL stimulation; alterations in baseline values may be attributed to the perception of stimulation during the task.

tIL stimulation was administered throughout the duration of the task

UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

What do our results indicate?

- Our results suggest that laser light is neuromodulatory and that we can see clearly an attenuation in the amplitude of motor-evoked-potentials, corresponding to a decrease in the ‘excitation’ of the motor system, compared to placebo stimulation.

- We aim to adapt these current techniques for use in patient populations (traumatic brain injury, Alzheimer’s disease, stroke) once tILS has been characterised within our healthy participant group and once safety parameters have been established for stimulation.

UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

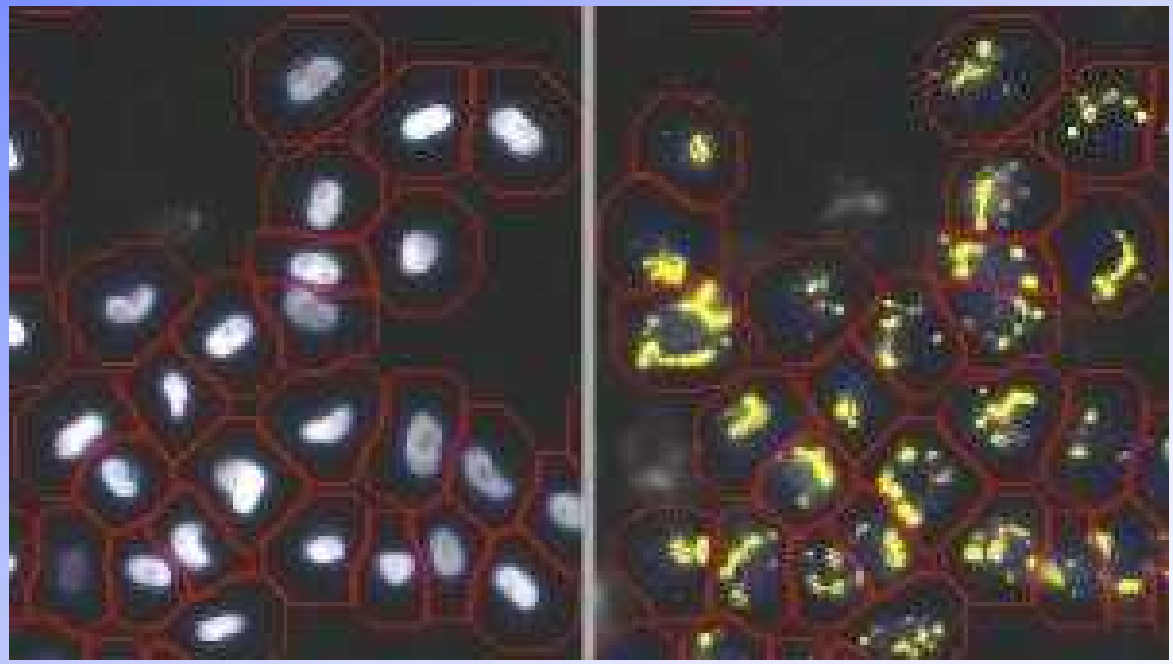
Front Behav Neurosci. 2015; 9: 147.
Published online 2015 Jun 2. doi: 10.3389/fnbeh.2015.00147
PMCID: PMC4451368

Neuroplastic effects of transcranial near-infrared stimulation (tNIRS) on the motor cortex

Leila Chaieb,[1,2,†] Andrea Antal and Walter Paulus[1]

Alzheimer-research: with the light pump against dementia

Frankfurter Allgemeine, Sunday, 8. January 2012



The left picuture shows zeigt intakt Neuroblastoma cells, the cell nuclei are white and the cell membranes are red ; the right picture shows the Beta-Amyloid-Plaques in yellow.

Alzheimer-Research: with the light pump against dementia

Frankfurter Allgemeine, Sonday, 8. January 2012

- 05.01.2012 · Engineers brought an extract of green tea (Epigallocatechingallate) in brain neuronal cells with following laser irradiation with red-infrared light and can push the Beta-Amyloid-Plaques of Alzheimer-Dementia successfully away

Photomedicine and Laser Surgery
Volume X, Number X, 2011
[a] Mary Ann Liebert, Inc.
Pp. 1–8
DOI: 10.1089/pho.2011.3073

670nm Laser Light and EGCG Complementarily Reduce Amyloid-b Aggregates in Human Neuroblastoma Cells: Basis for Treatment of Alzheimer's Disease?

Andrei P. Sommer, Ph.D.,1 Jan Bieschke, Ph.D.,2 Ralf P. Friedrich, Ph.D.,2 Dan Zhu, M.Sc.,1 Erich E. Wanker, Ph.D.,2 Hans J. Fecht, Ph.D.,1,3 Derliz Mereles, M.D.,4 and Werner Hunstein, M.D.5

Abstract

Conclusions:

Irradiation with moderate levels of 670-nm light and EGCG supplementation complementarily reduces Aß-aggregates in SH-EP cells. Transcranial penetration of moderate levels of red to near-infrared (NIR) light has already been used in the treatment of patientswith acute stroke.

The blood–brain barrier (BBB) penetration of EGCG (Epigallocatechin gallate) has been demonstrated in animals. We hope that our approach will inspire a practical therapy for AD.

Gendjar

Andrea

P.O. Box 1135

Frankfort, MI 49635

248-207-9507

avleigh@hotmail.com

Hello,
A Doctor Thomas Kabisch in Ann Arbor, Michigan was using your laserneedles on my elderly mom as therapy for her dementia. After only two sessions we saw a significant change in mom's abilities (for the better). We have recently moved out of the area, about 4 1/2 hours north by car and can no longer get mom that treatment. I have called the few natropathic doctors in the area and none have this therapy available I was wondering if I could get an idea of what the cost is for one of your machines with a headpiece for continuing on our own with the Transcranial laser therapy? Thank you in advance for your help. Andrea G.

Laser and brain

Research article

International Journal of Photoenergy

Special Issue: 'Laser Medicine Research and Laser Acupuncture'

December 3, 2013

Laser therapy and stroke – quantification of methodological requirements in consideration of yellow laser

Daniela Litscher, MSc and Gerhard Litscher, MSc, PhD, MDsc*

Laser and brain

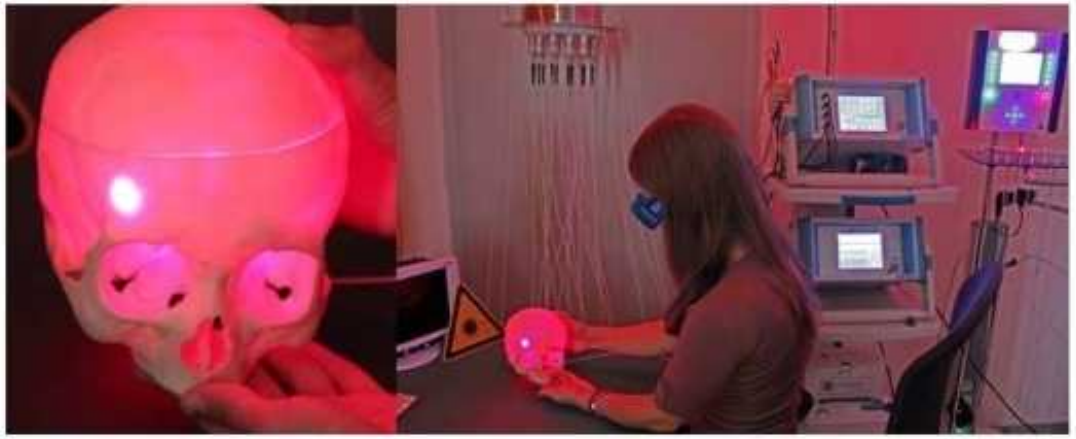


Fig. 1: Different kinds of laser equipment for transcranial laser stimulation.

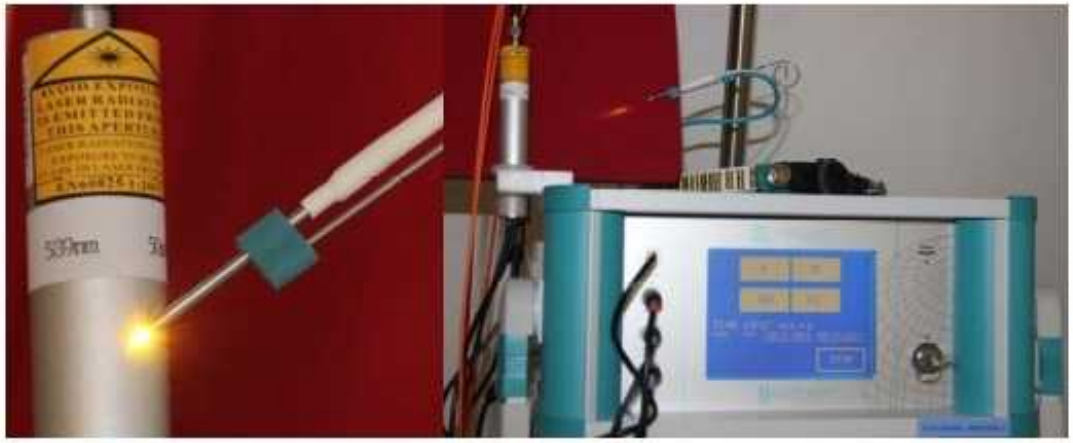
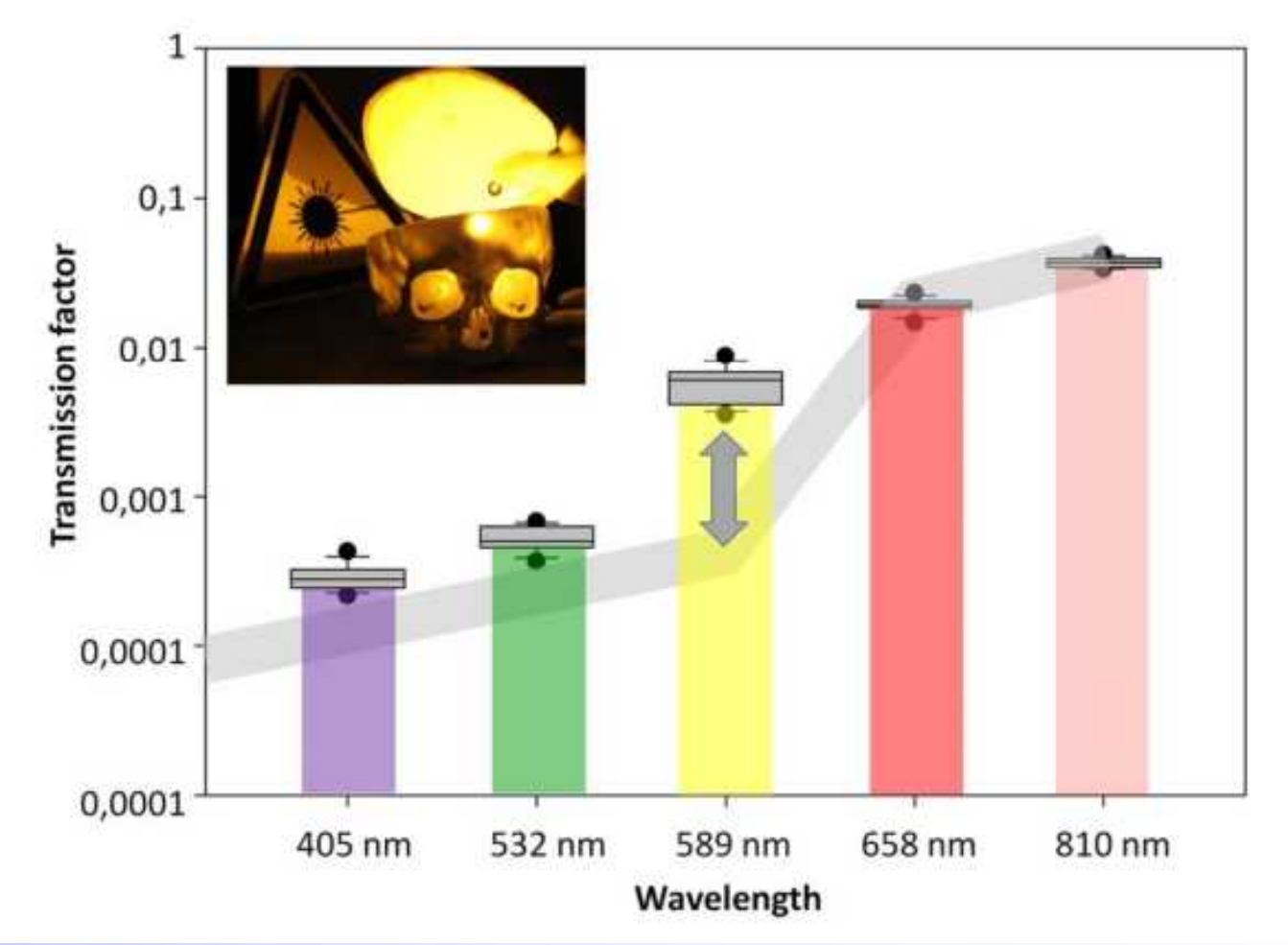


Fig. 2: First yellow laser (589 nm, 50 mW) for future medical applications at the Medical University of Graz.

Laser and brain



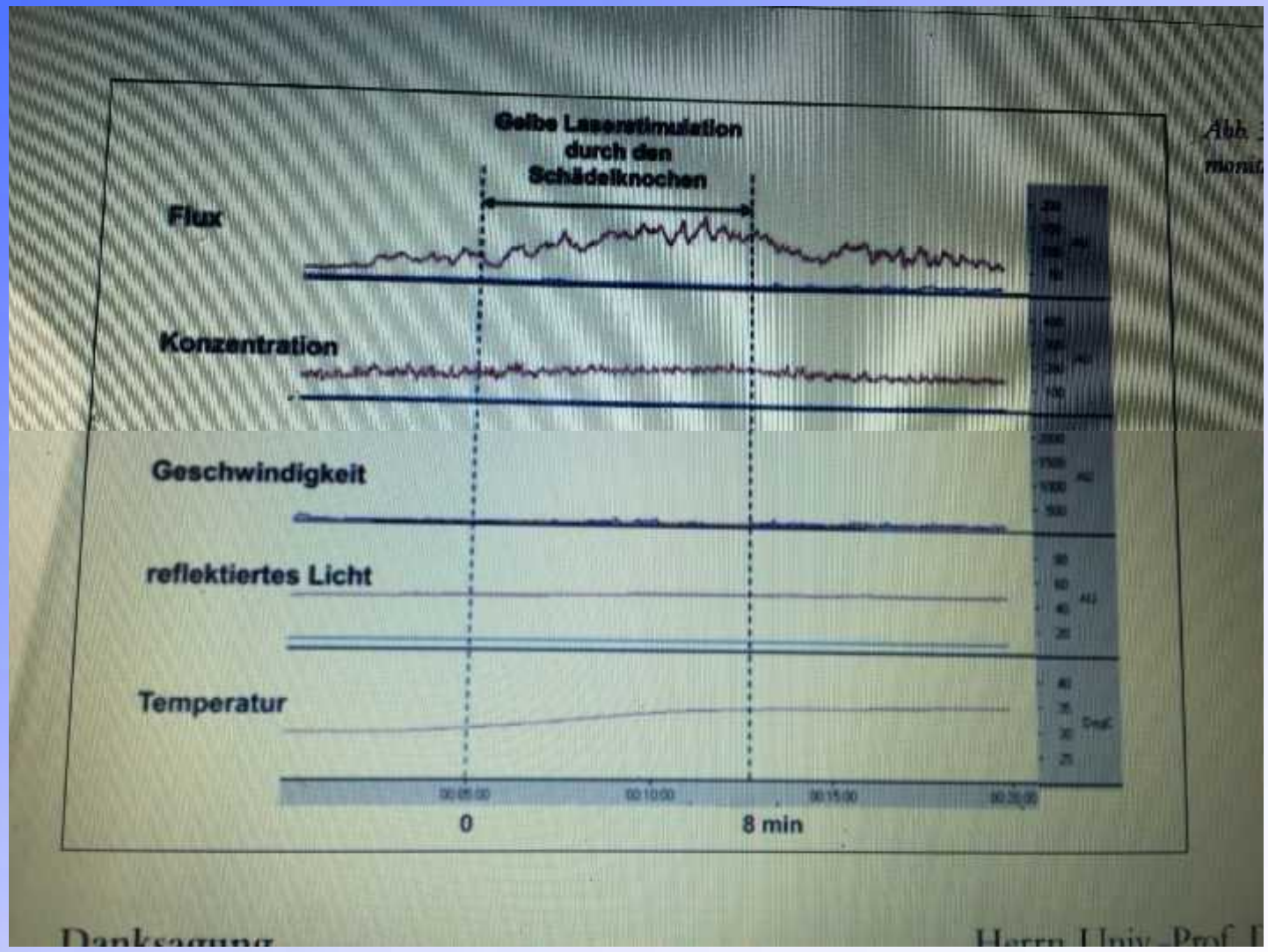
Gerhard Litscher, Frank Bahr und Daniela Litscher
Pain and Acupuncture 3/2015

YELLOW LASER STIMULATION ON THE SKULL – FIRST EVIDENCE OF MICROCIRCULATORY CHANGES IN THE LAB

YELLOW LASER STIMULATION ON THE SKULL

Gelbe Laserstimulation durch den menschlichen Schädelknochen (links) und Registrierung mikrozirkulatorischer stimulationsbedingter Verän
chts)

YELLOW LASER STIMULATION ON THE SKULL



Summary :

Within this pilot study it could be shown for the first time that transcranial yellow laser stimulation (589 nm, 50 mW, 500 µm) is able to induce microcirculatory changes in human tissue.
The results are important for future applications of yellow laser in the field of different neurological diseases. Further investigations concerning the optimal technical parameters are necessary.

Cell Transplant. Epub 2014 Mar 11.

The possible role of stem cells in acupuncture treatment for neurodegenerative diseases: a literature review of basic studies.

Ho TJ[1], Chan TM, Ho LI, Lai CY, Lin CH, Lin SZ, Chen YH

This review reports on recent findings concerning the effects of acupuncture and electroacupuncture (EA) on stem cell mobilization and differentiation, in particular with regard to neurogenesis. Traditional Chinese acupuncture has a history of over 2,500 years and is becoming more popular worldwide. Evidence has demonstrated that acupuncture may be of benefit in stroke rehabilitation, parkinsonism, dementia, and depression. This article reviews recent studies concerning the effects of acupuncture/EA on stem cell mobilization and on progenitor cell proliferation in the CNS. The reviewed evidence indicates that acupuncture/EA has beneficial effects in several neurodegenerative diseases, and it may prove to be a nondrug method for mobilizing stem cells in the CNS.

Does **acupuncture** help stem cells?

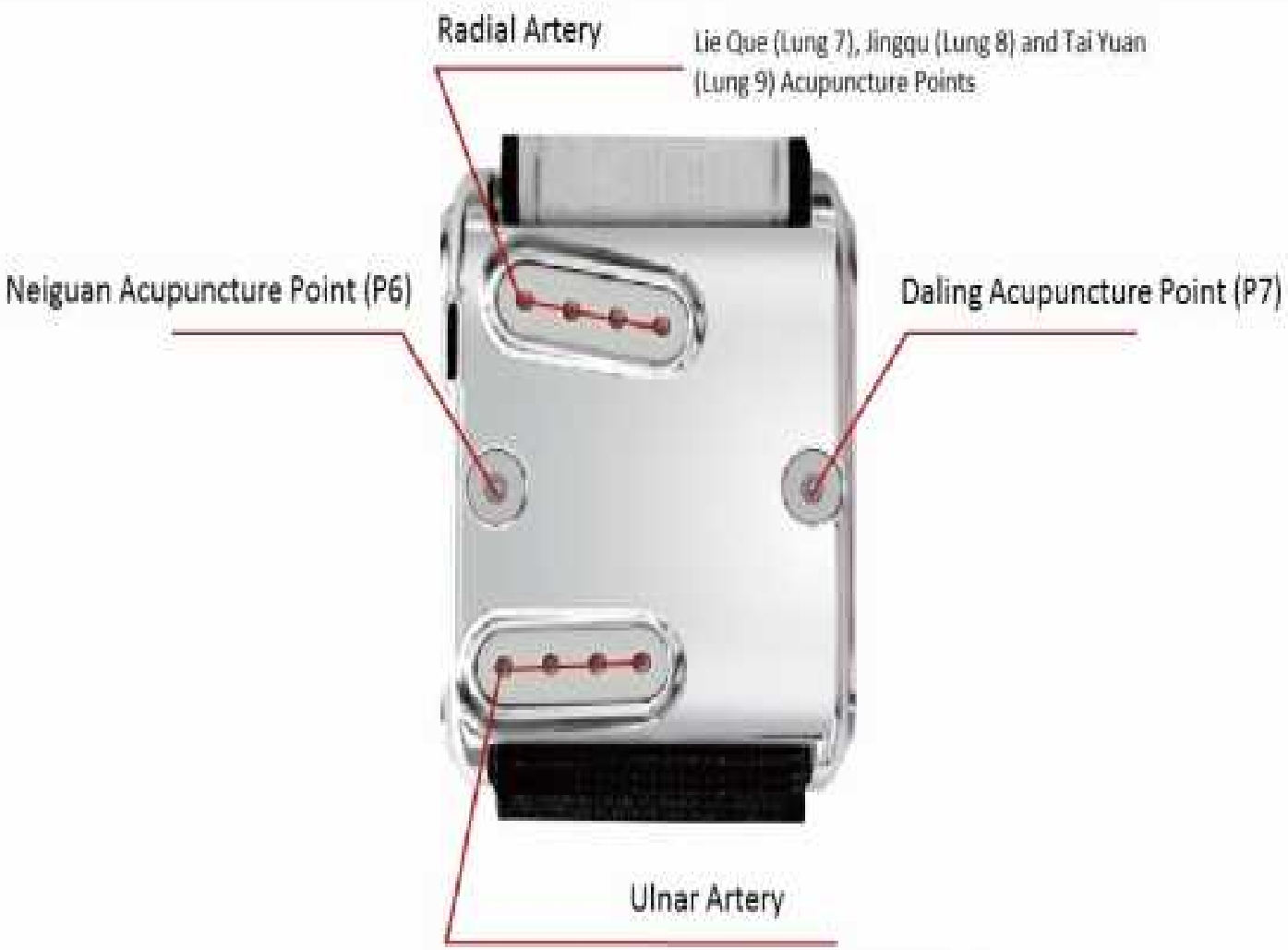
In animal models:

- ✓ Increases survival and engraftment of stem cells transplanted for spinal cord injury
- ✓ Helps stem cells differentiate into brain cells
- ✓ Increases the number of stem cells in brain injury

Regenexx®

Stem Cell Rev. 2014 May 2. Cell Transplant. 2013;22(1):65-86 Chin J Integr Med. 2013 Feb;19(2):132-6

Laser watch for wrist acupuncture and intravascular treatment


Radial Artery
Lie Que (Lung 7), Jingqu (Lung 8) and Tai Yuan (Lung 9) Acupuncture Points
Neiguan Acupuncture Point (P6)
Daling Acupuncture Point (P7)
Ulnar Artery
Lingdao (Heart 4), Tongli (Heart 5), Yinxi (Heart 6) and Shenmen (Heart 7) Acupuncture Points

Laserwatch 1st generation

Laserwatch 2nd generation

Laserwatch 3rd generation

Laserwatch 3rd generation

Laserwatch 3rd generation

Accessories: Laser Pad

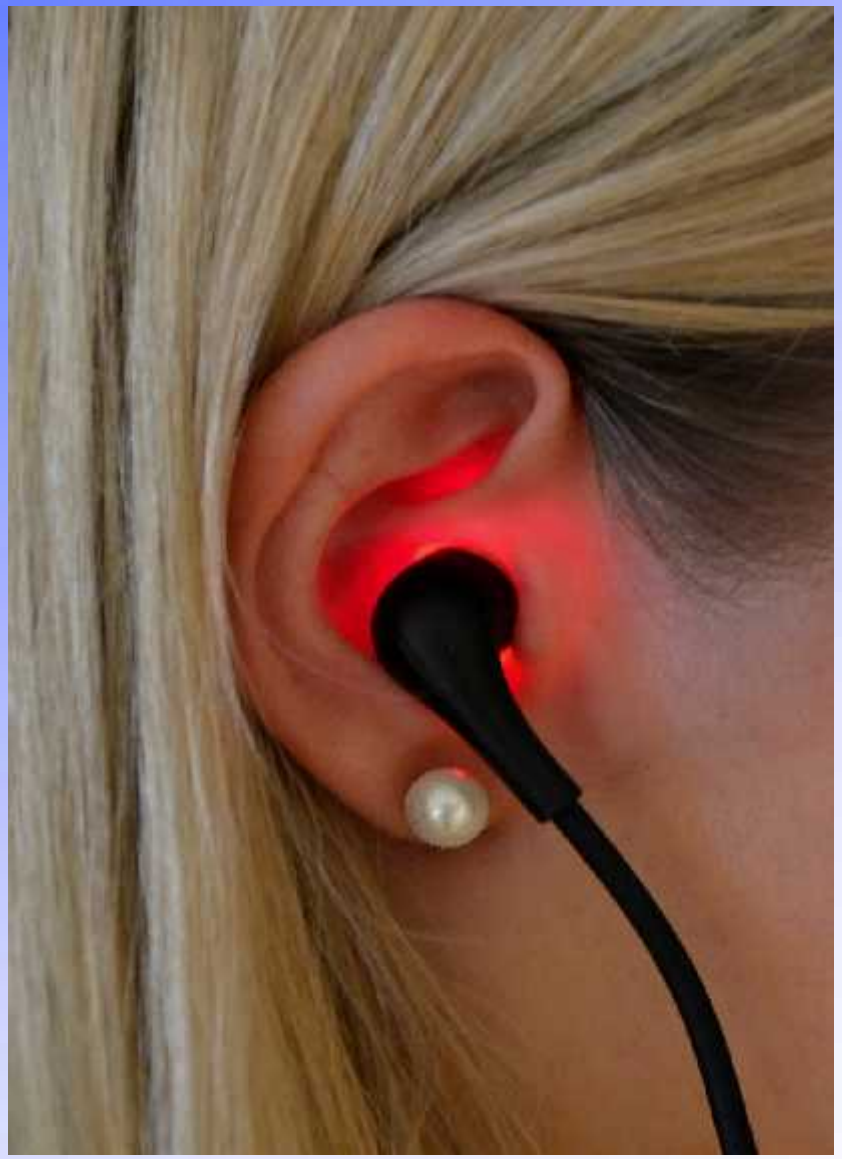
Accessories: Laser Pad

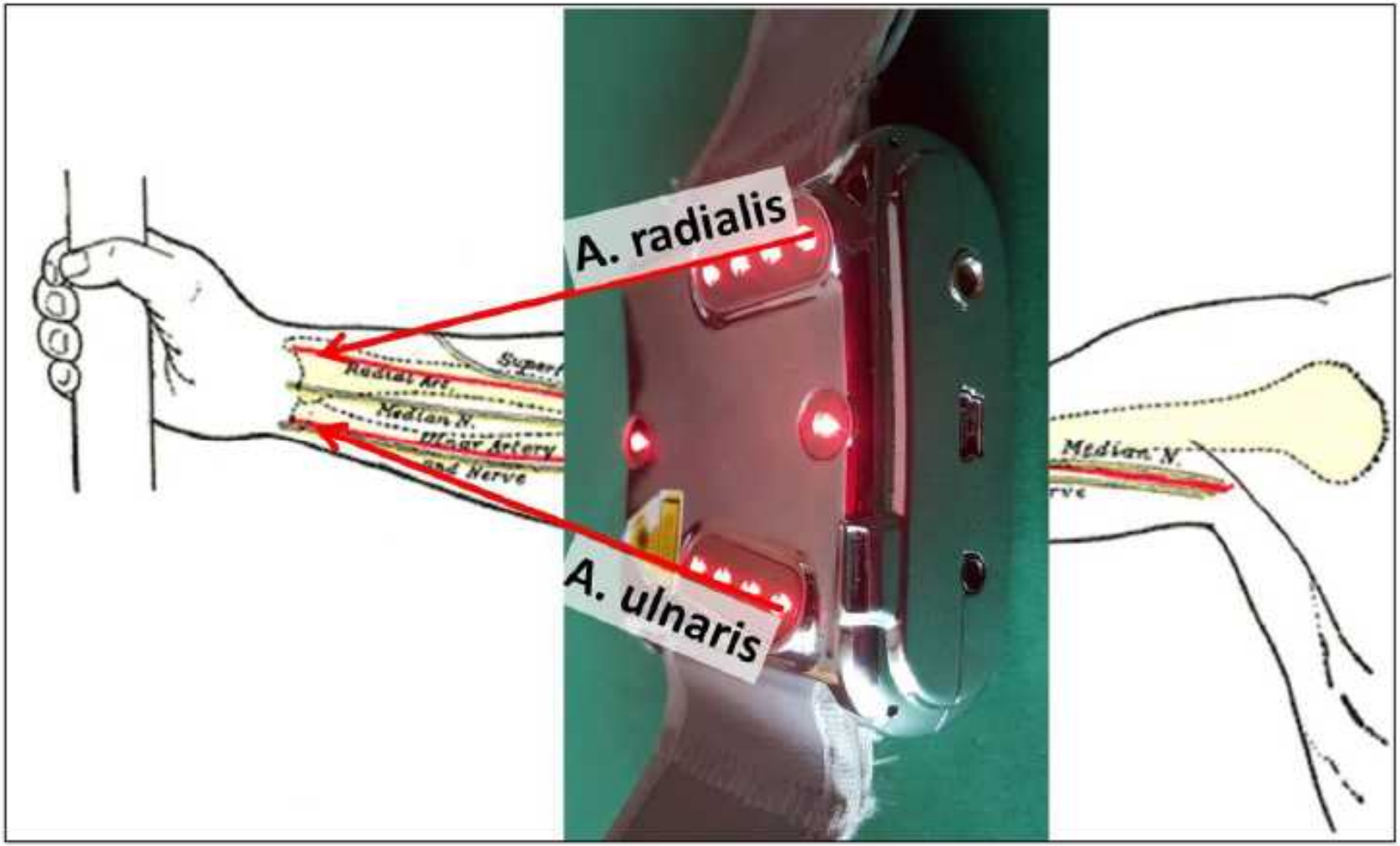
Accessories: Nose Adapter

Accessories: Nose Adapter

Accessories: Ear Adapter

Accessories: Ear Adapter





ig. 2: Laser blood irradiation with the laser watch

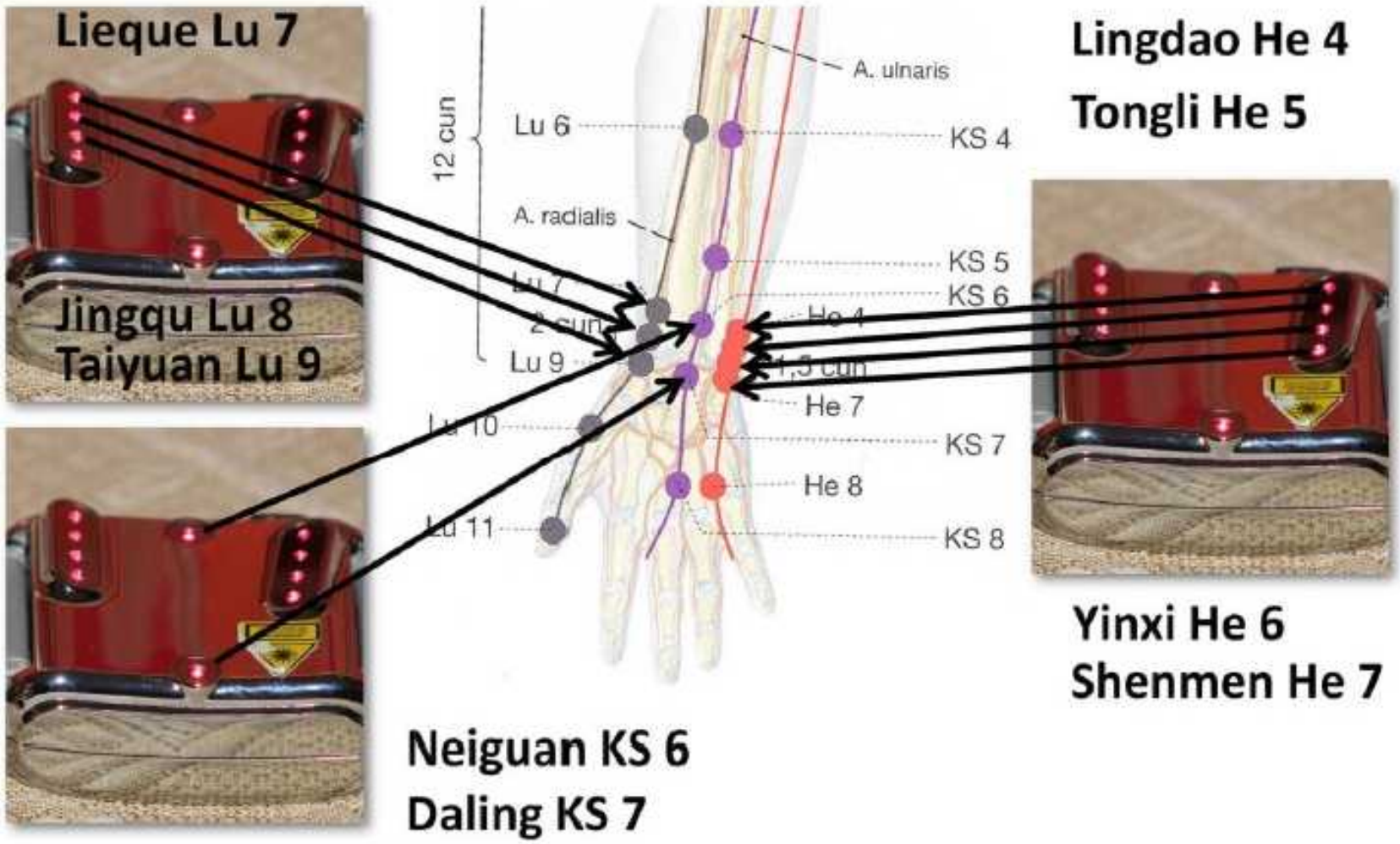


Fig. 3: Acupuncture points which are stimulated through the laser watch (mod. from [5]).

Indications

1. Improvement of blood viscosity and microcirculation as a protection against heart attacks and stroke
2. Improvement of hypertension
3. Improvement of the immune system by stimulation of the different white blood cells
4. General energising effects which act against fatigue and contribute to improved performance
5. Improved sleep by increased release of serotonin and melatonin
6. Prevention of jet lag after long flights by enhanced release of melatonin
7. Protection against thrombosis (on long flights)
8. Anti-inflammatory effects in combination with UltraCur+ (Curcumin)
9. Additive cancer therapy and prevention in combination with chlorophyll

Own study results:

Significant increase of Melatonin (30-100 %)

(Dr. Weber in A 380 from Bangkok to Frankfurt)

From laser research

Zeitschrift für Akupunktur & Aurikulomedizin
Magazine for acupuncture and auricular medicine

5th October 2015

Daniela Litscher und Gerhard Litscher

LASER WATCH – SIMULTANEOUS LASER ACUPUNCTURE AND LASER BLOOD IRRADIATION AT THE WRIST

Research unit for Complementary and Integrative Laser Medicine,
Research unit for Biomedical Technology in Anaesthesia and Intensive Care
TCM Forschungszentrum (Research centre) Graz, Medizinische Universität Graz (Medical University of Graz), 8036 Graz, Austria

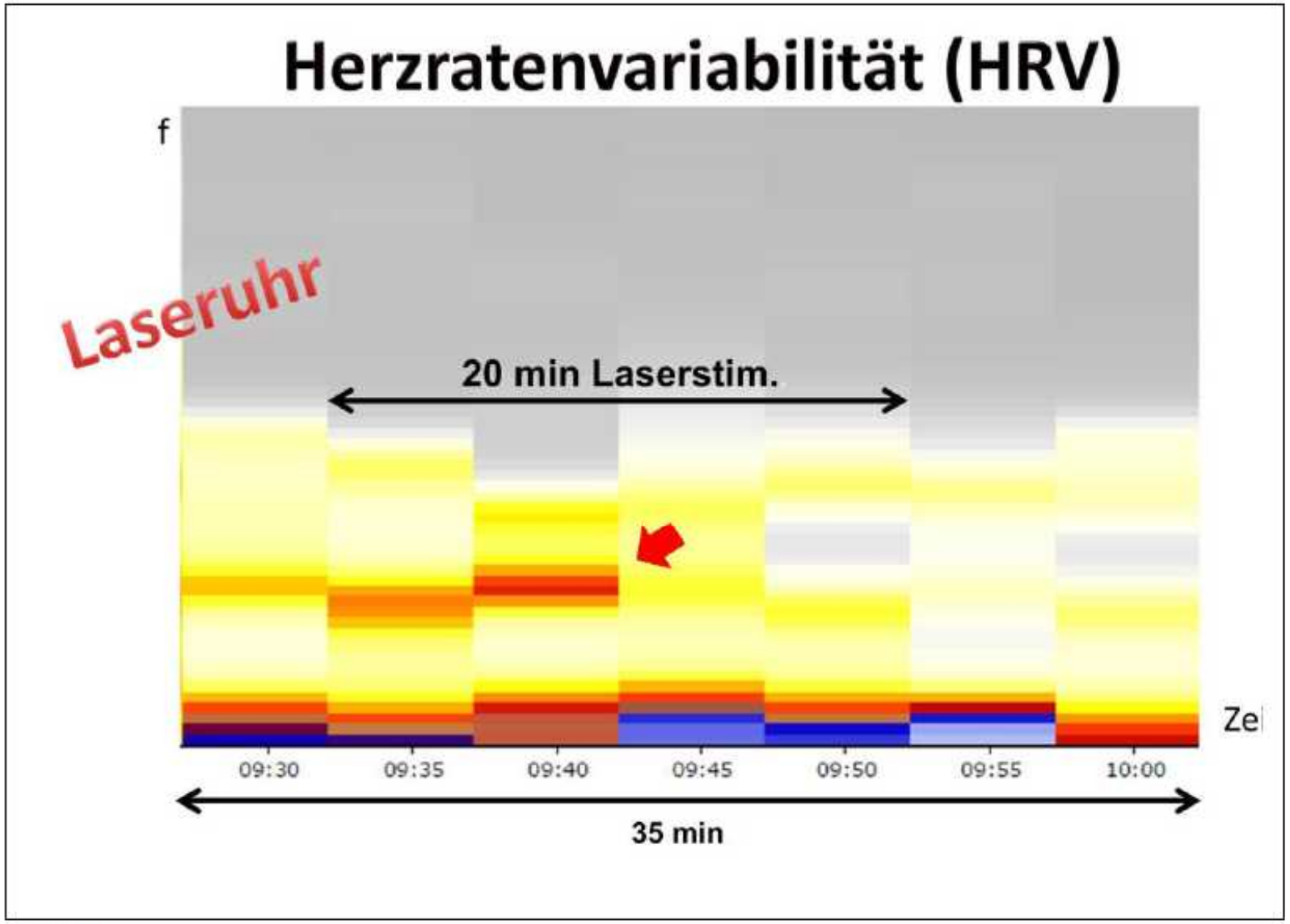


Diagram:

Heart Rate Variability (HRV)

Laser watch

20 minute laser stimulation

Time

Laseruhr

Mikrozirkulation

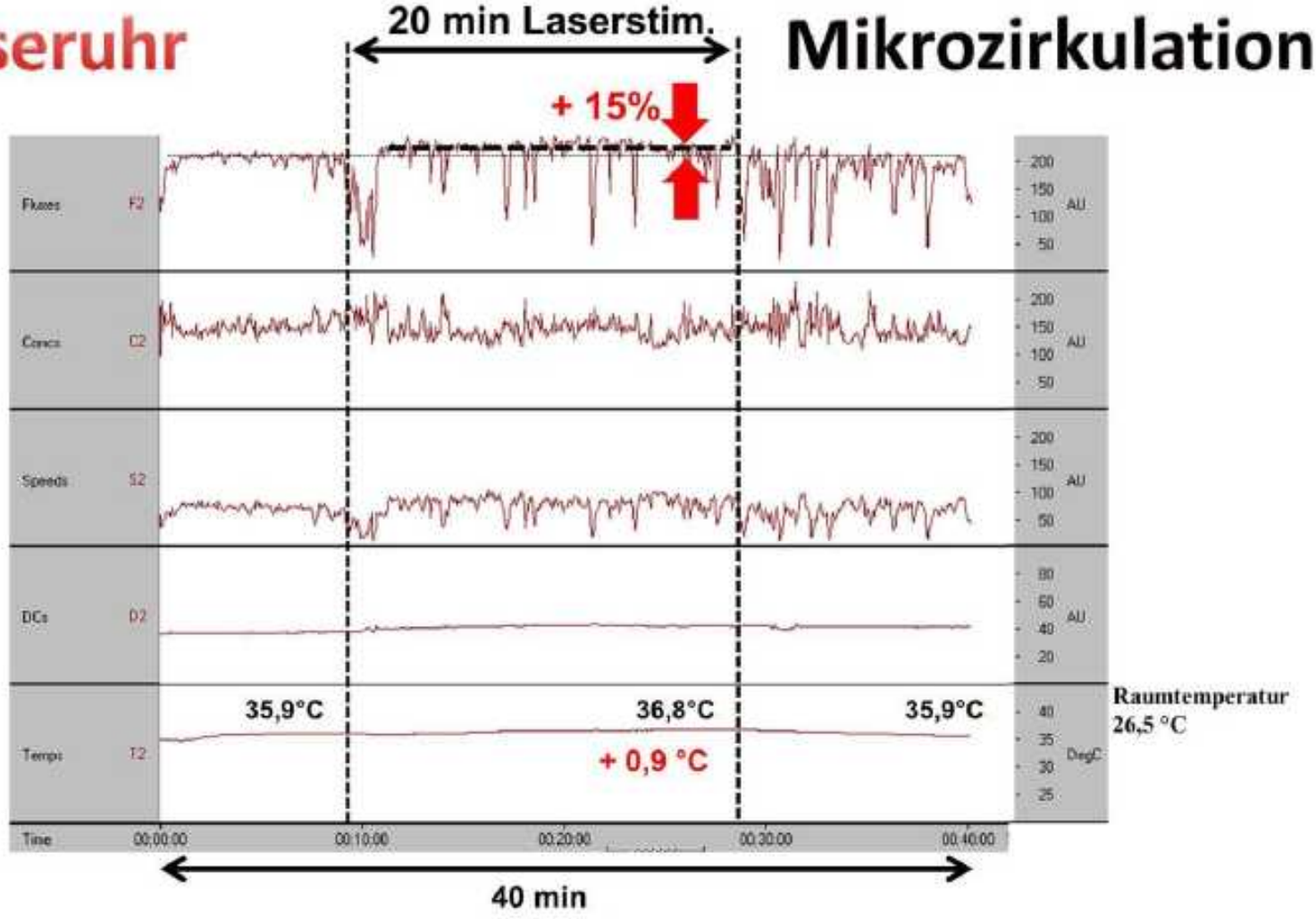


Diagram:

Laser watch 20 minute laser stimulation Microcirculation

Room temperature

Evid Based Complement Alternat Med. 2014; 2014: 937601.
Published online 2014 Aug 5. doi: 10.1155/2014/937601
PMCID: PMC4138813

Laser Acupuncture at HT7 Acupoint Improves Cognitive Deficit, Neuronal Loss, Oxidative Stress, and Functions of Cholinergic and Dopaminergic Systems in Animal Model of Parkinson's Disease

Jintanaporn Wattanathorn [1, 2, *] and Chatchada Sutalangka [2, 3]
Department of Physiology, Faculty of Medicine, Khon Kaen University, Khon Kaen 40002, Thailand

In conclusion, laser acupuncture at HT7 can improve neuron degeneration and memory impairment in animal model of PD partly via the decreased oxidative stress and the improved cholinergic and dopaminergic functions.

The new laser watch first multi center study in Switzerland

Dr. med. Andreas Wirz-Ridolfi, Reinach/Schweiz
Prof. VRC, Chirurgie FMH, Akupunktur/TCM

MEDI-CHINA
中国传统医学中心
Zentrum für Traditionelle Chinesische Medizin

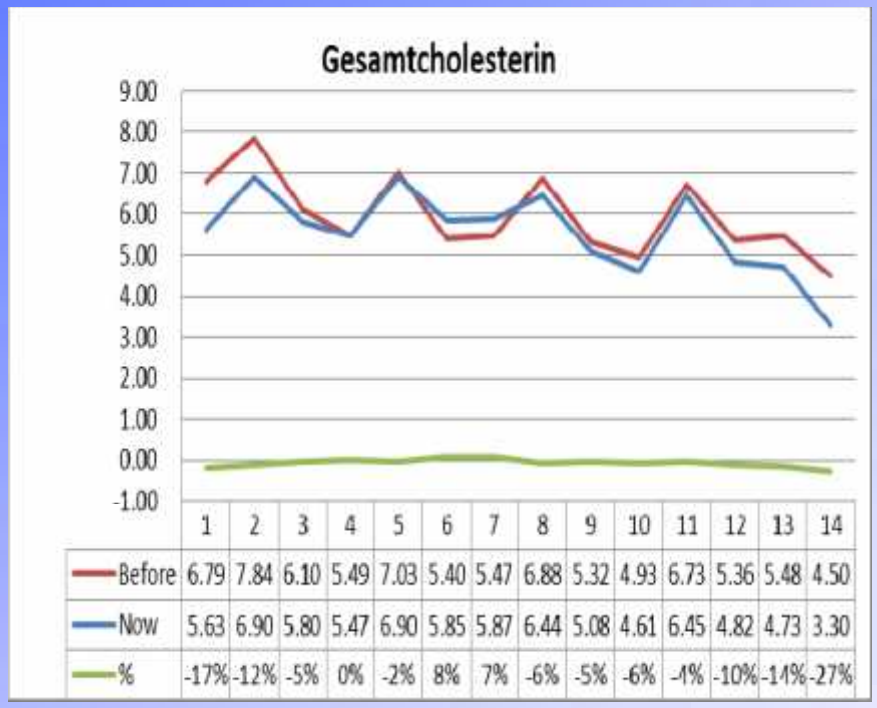
Participants

- 20 patients (12 male,8 female), 18 bis 76 y.
- 2 patients with type 1 diabetes
- 18 patients with type 2 diabetes

Results: Blood pressure

- Highest value:
- Before: 170/90, after: 140/85 mmHg
- Lowering of blood pressure in avarage:
- Systolic 10,04, Diastolic 6,54 mmHg
- In percentage: 7,9 %

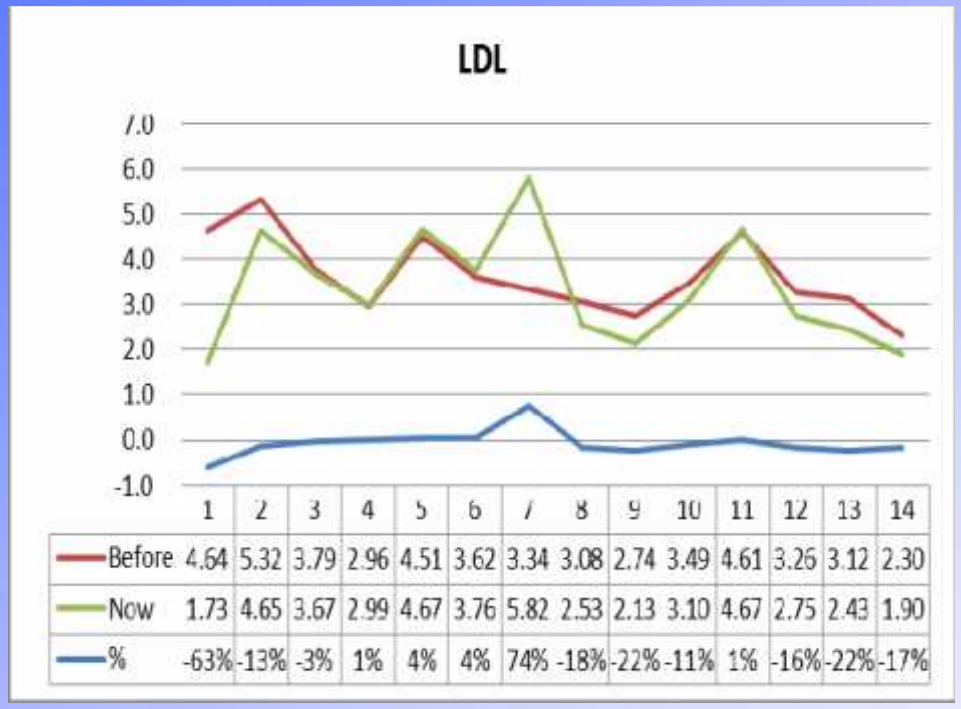
Lipids: Cholesterol



	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Before	6.79	7.84	6.10	5.49	7.03	5.40	5.47	6.88	5.32	4.93	6.73	5.36	5.48	4.50
Now	5.63	6.90	5.80	5.47	6.90	5.85	5.87	6.44	5.08	4.61	6.45	4.82	4.73	3.30
%	-17%	-12%	-5%	0%	-2%	8%	7%	-6%	-5%	-6%	-4%	-10%	-14%	-27%

- Average before:5,95, after: 5,5mmol/l
- Lowereing in avarage: - 0,39 mmol/l
- In percentage: - 6,6 %

Lipids: LDL



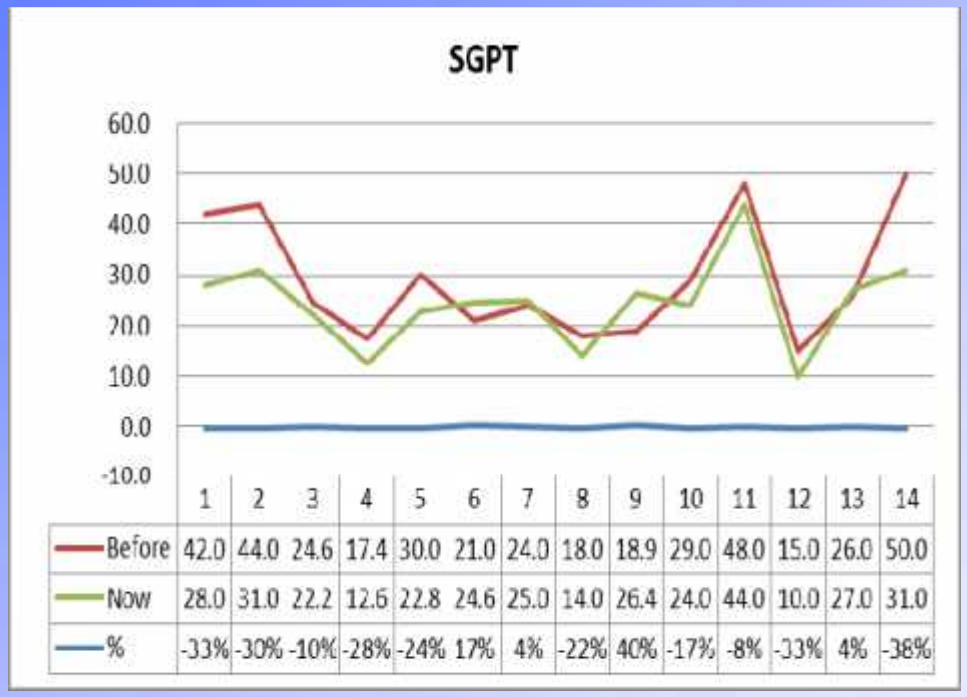
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Before	4.64	5.32	3.79	2.96	4.51	3.62	3.34	3.08	2.74	3.49	4.61	3.26	3.12	2.30
Now	1.73	4.65	3.67	2.99	4.67	3.76	5.82	2.53	2.13	3.10	4.67	2.75	2.43	1.90
%	-63%	-13%	-3%	1%	4%	4%	74%	-18%	-22%	-11%	1%	-16%	-22%	-17%

Avarage before: 3,63, after: 3.34 mmol/l.

Lowering in avarage: - 0,28 mmol/l

- In percentage: - 7,8 %

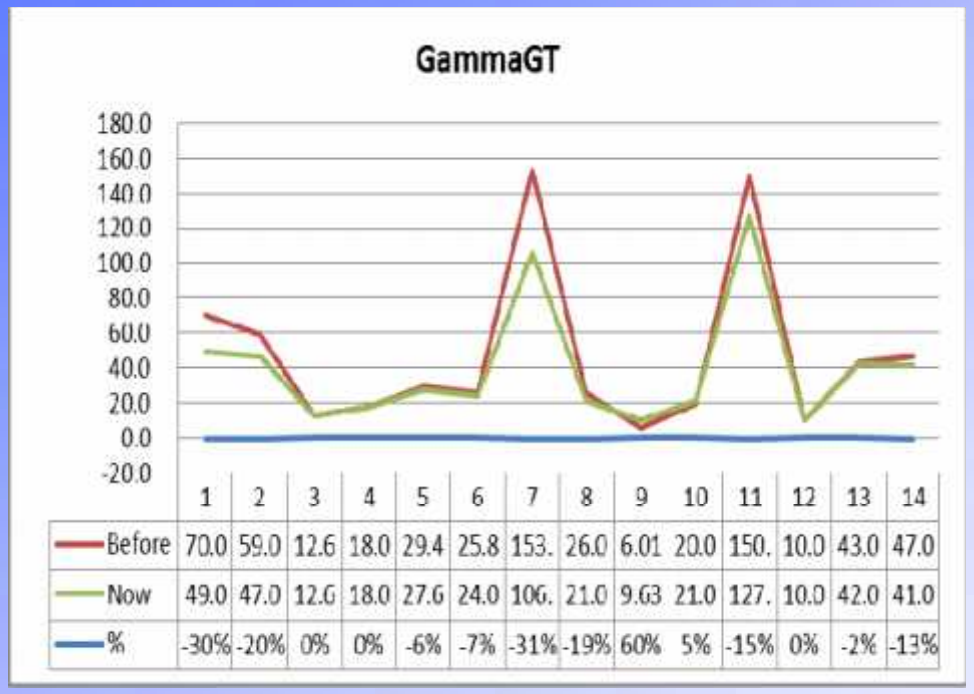
Liver: GPT



	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Before	42.0	44.0	24.6	17.4	30.0	21.0	24.0	18.0	18.9	29.0	48.0	15.0	26.0	50.0
Now	28.0	31.0	22.2	12.6	22.8	24.6	25.0	14.0	26.4	24.0	44.0	10.0	27.0	31.0
%	-33%	-30%	-10%	-28%	-24%	17%	4%	-22%	40%	-17%	-8%	-33%	4%	-38%

- Avarage before: 29,14 IU/l. after: 24,47 IU/l
- Lowering in avarage: - 4,66 IU/l
- In percentage: - 16,0 %

Liver: GammaGT



	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Before	70.0	59.0	12.6	18.0	29.4	25.8	153.	26.0	6.01	20.0	150.	10.0	43.0	47.0
Now	49.0	47.0	12.6	18.0	27.6	24.0	106.	21.0	9.63	21.0	127.	10.0	42.0	41.0
%	-30%	-20%	0%	0%	-6%	-7%	-31%	-19%	60%	5%	-15%	0%	-2%	-13%

- Average before: 47,84 IU/l, after: 39,70
- Lowering in avarage: - 8,14 IU/l
- In percentage: - 17,0 %

Case report diabetes mellitus type 2

Patient, 62 J., male, therapy with

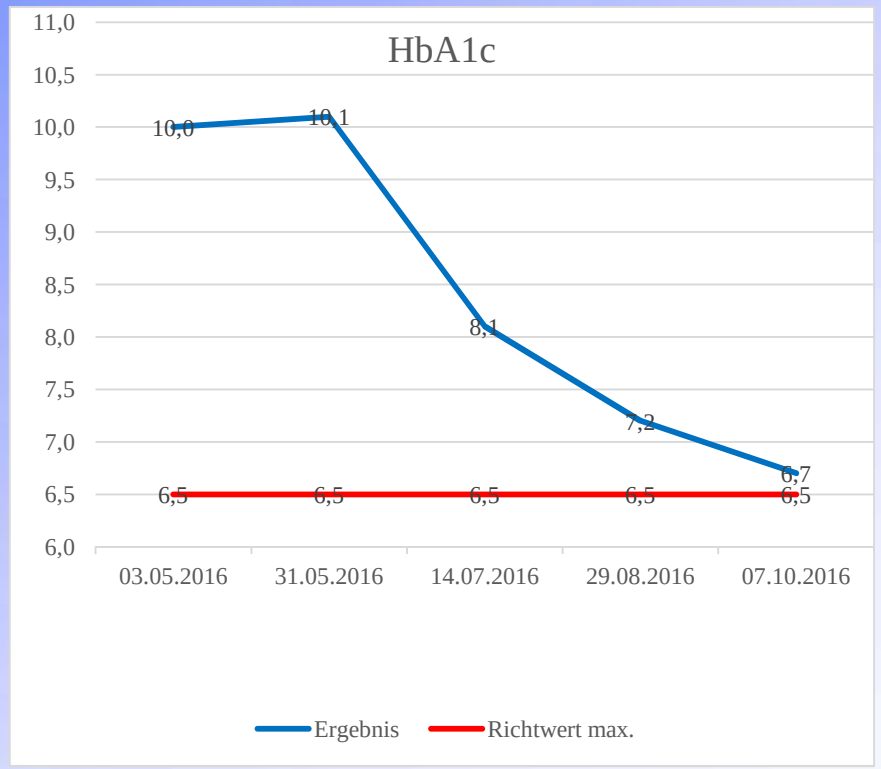
Metformin 2 x 1000 mg, Candesartan 32 mg

Diagnosis: Diabetes Typ 2, Hypertension

Therapy:
3 month red laser watch,
3 months red-blue laser watch in combination with
Curcumin (Ultracur)

Case report: HbA1c

Datum	Parameter	Ergebnis	Richtwert max.
03.05.2016	HbA1c	10,0	6,5
31.05.2016	HbA1c	10,1	6,5
14.07.2016	HbA1c	8,1	6,5
29.08.2016	HbA1c	7,2	6,5
07.10.2016	HbA1c	6,7	6,5

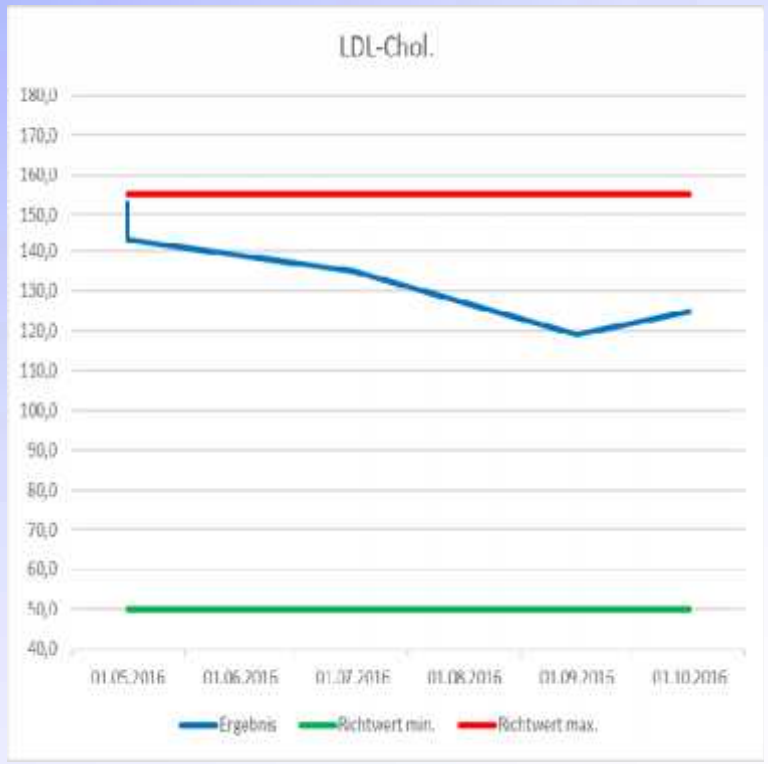


Case report: Cholesterol

Datum	Parameter	Ergebnis	Richtwert max.
03.05.2016	Cholesterin	208,0	200,0
31.05.2016	Cholesterin	210,0	200,0
14.07.2016	Cholesterin	199,0	200,0
05.09.2016	Cholesterin	178,0	200,0
07.10.2016	Cholesterin	189,0	200,0

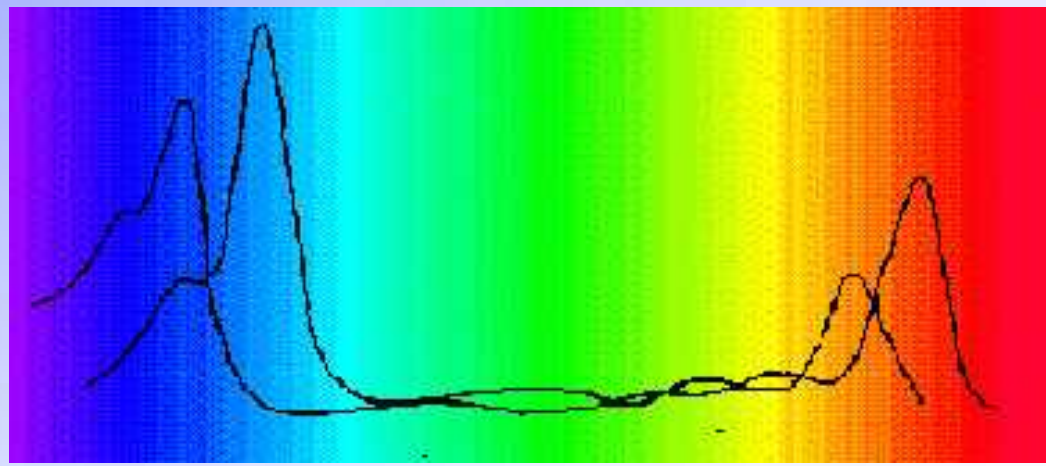
Case report: LDL-Cholesterol

Datum	Parameter	Ergebnis	Richtwert min.	Richtwert max.
03.05.2016	LDL-Chol.	153,0	50,0	155,0
31.05.2016	LDL-Chol.	143,0	50,0	155,0
14.07.2016	LDL-Chol.	135,0	50,0	155,0
05.09.2016	LDL-Chol.	119,0	50,0	155,0
07.10.2016	LDL-Chol.	125,0	50,0	155,0



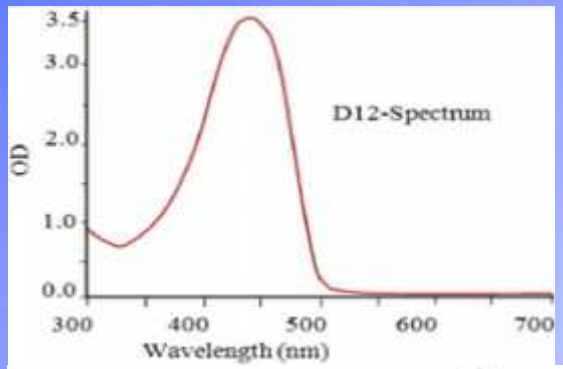
Combination of the laser watch with different supplements

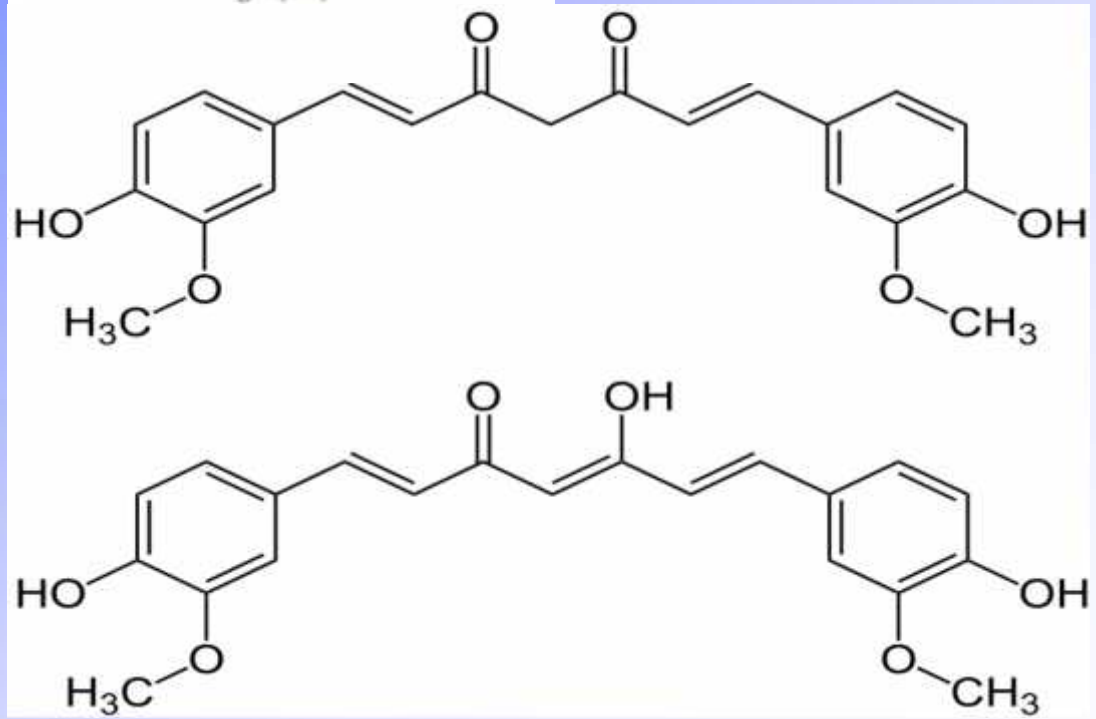
Combination laser watch with Chlorophyllin (water soluble)



Photoactive+ is an intelligent supplement rom natural plant extracts. It combines water soluble Chlorphyllin (green) with Phycocyanine (blue)

Combination laserwatch with Curcumin





Photodynamic effects:

- Curcumin absorbs blue light 447 nm
- Is a highly effective **Photosensitizer** for PDT for cancer, infectious and autoimmune diseases
- Is in low concentrations phototoxic, works a sonosensitizer, stimulates the immune system, antitumoral, antimetastatic and antiangiogenetic effects

Combination with curcumin

UltraCur +

Curcumin:
Strong antioxidant
with anti-inflammatory and
pain-reducing effects

Highly concentrated curcumin with a 15,000-fold bioavailability

Due to a special protein binding the full potential of this unique medicinal plant can be realized for the first time!

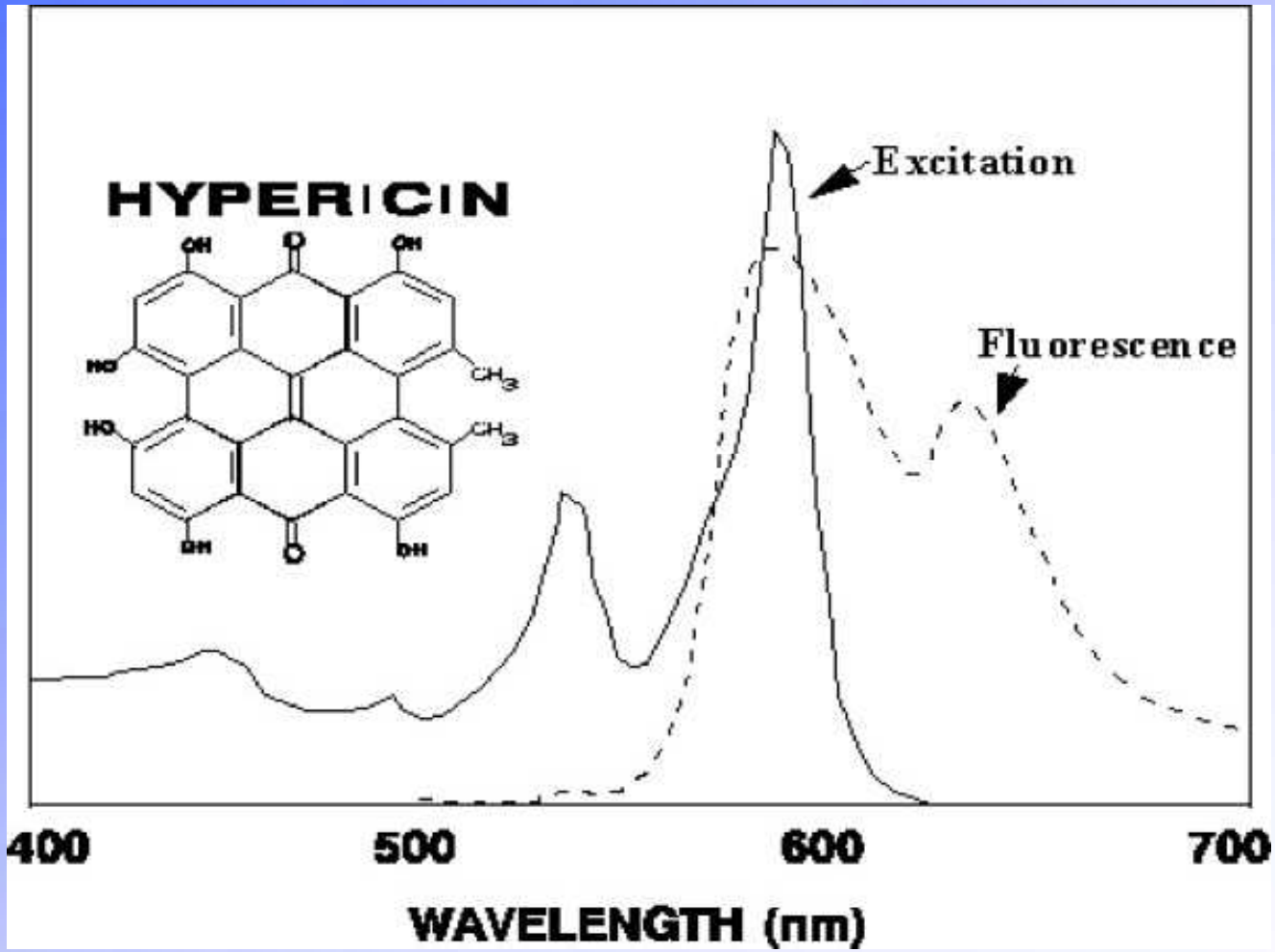
One capsule UltraCur+ has the efficacy of 120g of curcumin.

In relation to conventional curcumin this corresponds to a 15,000-fold bioavailability.

Combination laserwatch with Hypericin

St. John‘s wart plant

Hypericin as photosensitizer



Effects

- Prevention and treatment of metabolic diseases
- Prevention and treatment of inflammations and infections
- Prevention and treatment of autoimmune diseases
- Prevention and treatment of aging
- Prevention and support of cancer treatment

Thank you

See you all at

ISLA 2017, June 9 -10
in Germany