

# Photobiomodulation/Light Therapy: How to benefit from the latest innovations



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# Outline

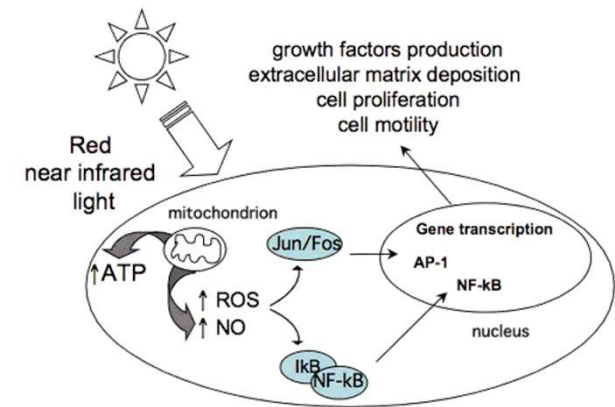


- Background: Applications of LLLT/PBM
- Development of the so-called “Laser Watch”
- Studies and research
- The new Endolight®
- Accessories
- Combination with photosensitizer formulations
- Transcranial applications with the “Infrared Helmet”

# Low-Level Laser Therapy (LLLT) and Photodynamic Therapy (PDT)

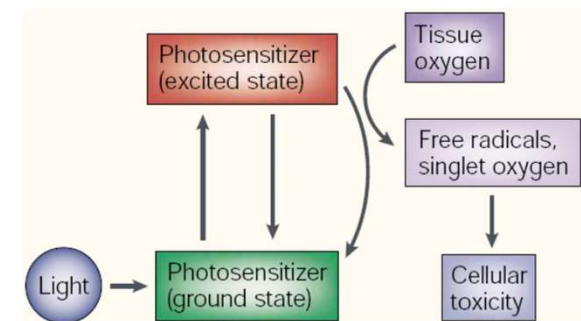
## Low-Level Laser Therapy (LLLT) / Photobiomodulation (PBM):

- Stimulation of specific cellular structures, cytokines, growth factors → boosting ATP, immune system, microcirculation
- Application in Regenerative Medicine (i.e. wound and soft tissue healing, relief of inflammation and pain, treatment of systemic diseases etc.)

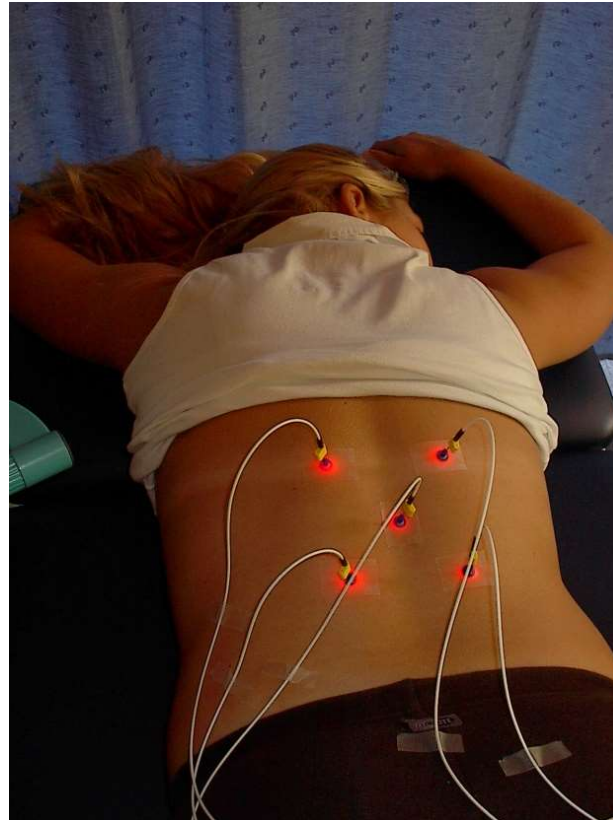


## Photodynamic Therapy (PDT):

- Combination of (laser-) light with light sensitive substances (photosensitizers)
- Photodynamic effect = killing of tumor cells or pathogens like parasites, viruses etc.

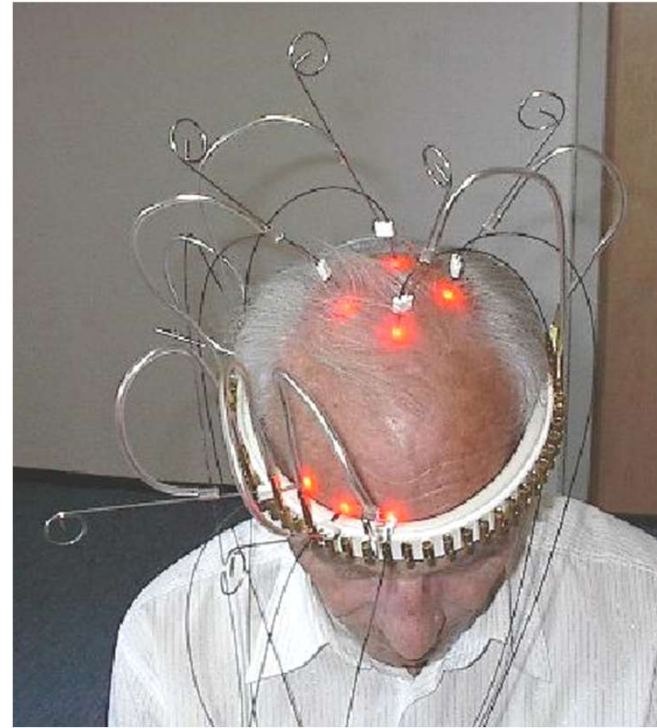


## Low-Level Laser Therapy (LLLT) / Photobiomodulation:



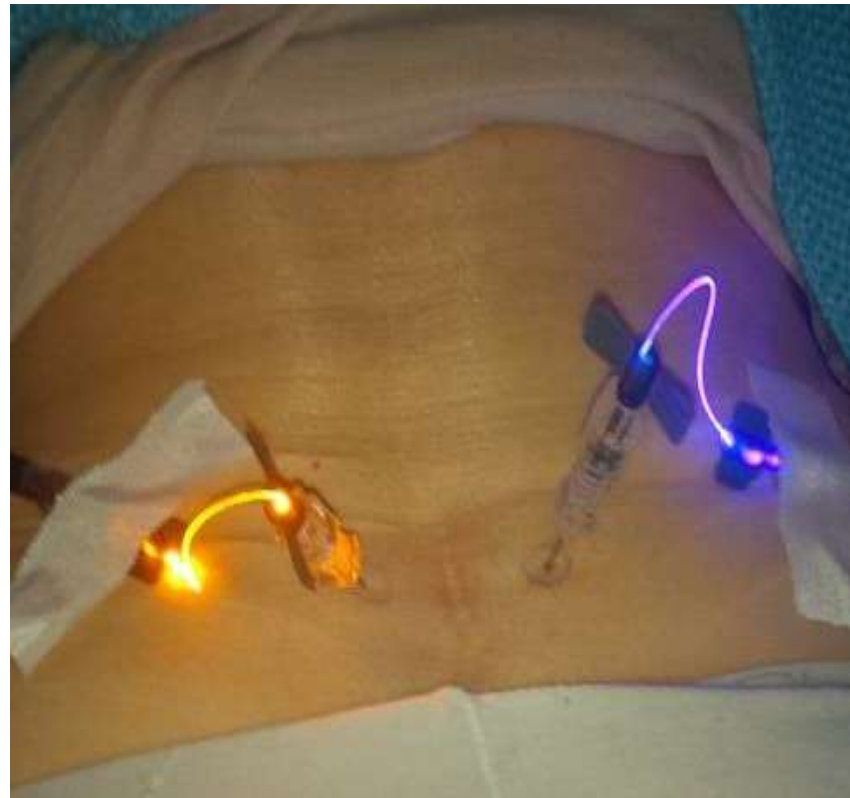
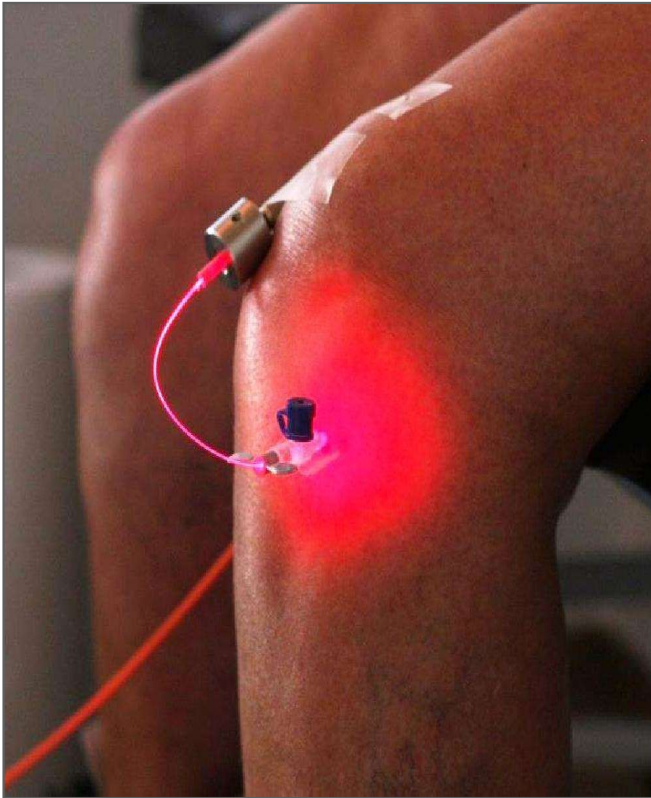
Topical / external application

## Low-Level Laser Therapy (LLLT) / Photobiomodulation:



Transcranial application

## Low-Level Laser Therapy (LLLT) / Photobiomodulation:



Interstitial / Intra-articular application

## Low-Level Laser Therapy (LLLT) / Photobiomodulation:

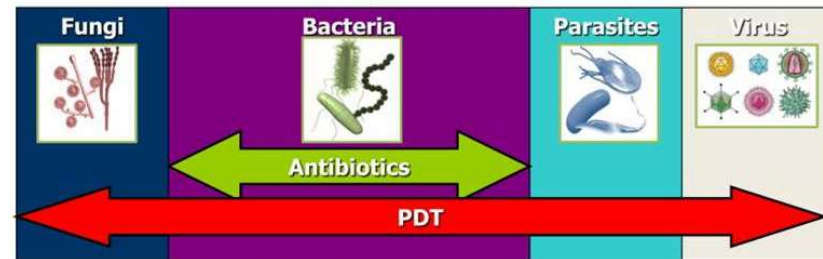
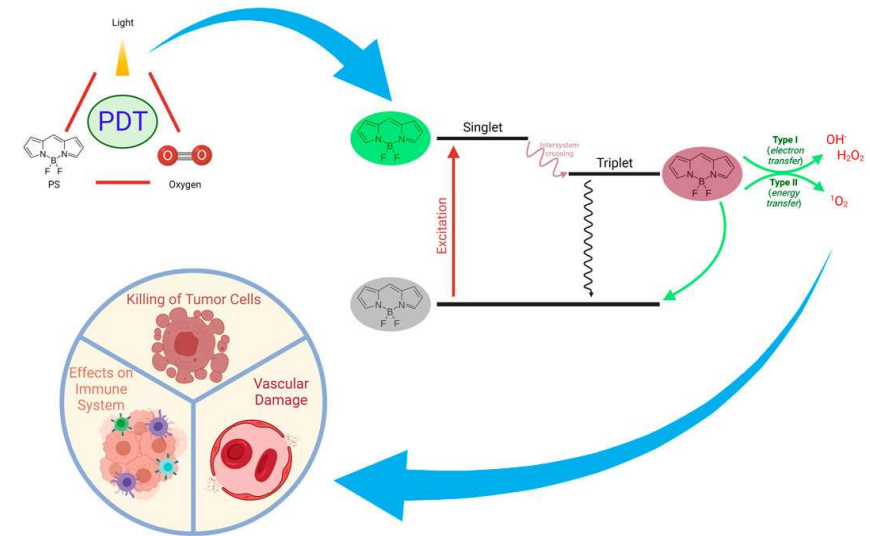


Systemic / intravenous application

# Low-Level Laser Therapy (LLLT) / Photobiomodulation:



Photodynamic Therapy





## Low-Level Laser Therapy (LLLT) / Photobiomodulation:



Home-use applications

# Scientific Partnerships



GEORG-AUGUST-UNIVERSITÄT  
GÖTTINGEN



**ISLA**  
RESEARCH  
GROUP

International Society for Medical Laser Applications

Philipps



Universität  
Marburg



Medizinische Universität Graz



**UNIMORE**  
UNIVERSITÀ DEGLI STUDI DI  
MODENA E REGGIO EMILIA

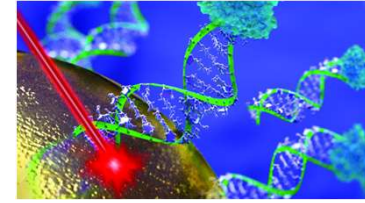
**MAYO  
CLINIC**



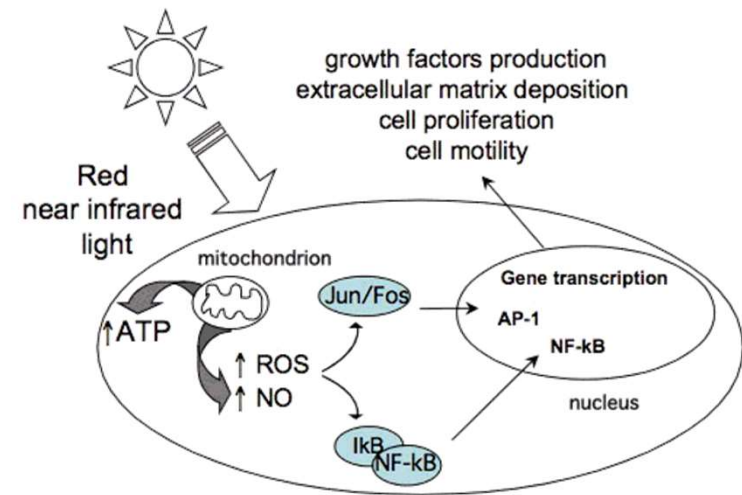
**UNIVERSITY OF MEDICAL SCIENCES  
ONDO STATE, NIGERIA**



# Biochemical Mechanisms

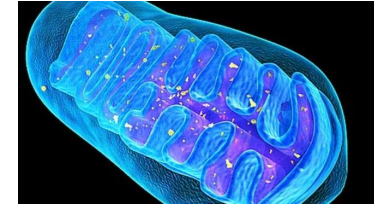


- In general, there are specific cellular structures that can absorb specific wavelengths (colors) of light (known as photoreceptors)
- The light stimulus gives a cellular signal affecting the chemical behavior, metabolism, movement and gene expression
- All associated enzymes and/or proteins are now affected
- This cascade event can ripple across an entire cell

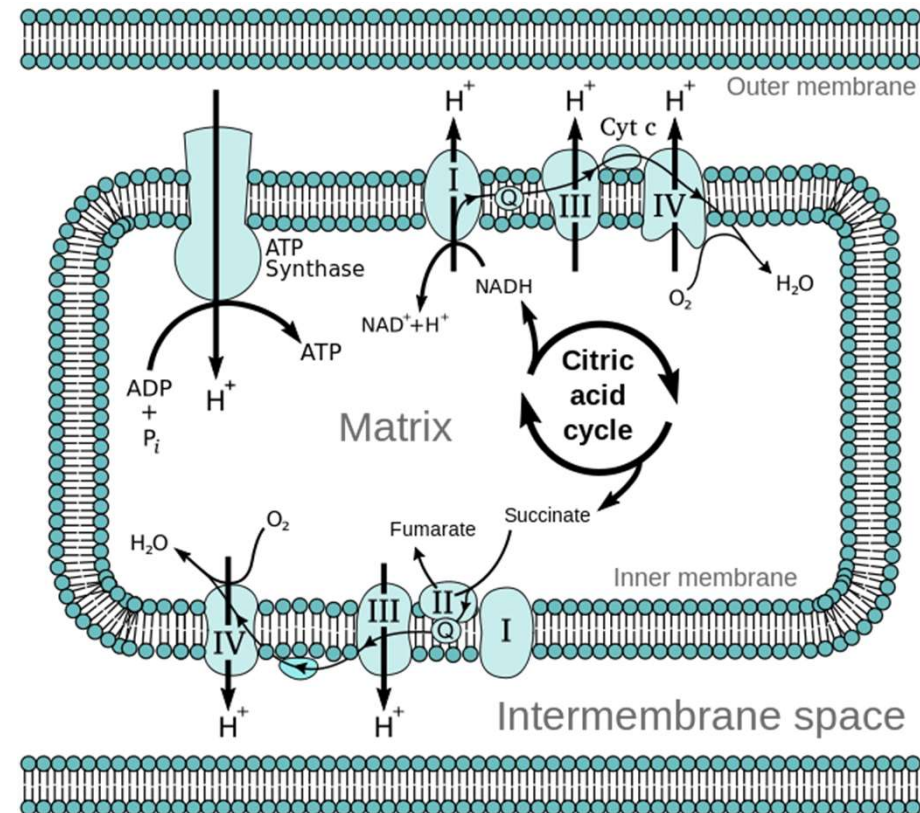


Hamblin:  
<http://photobiology.info/Hamblin.html>

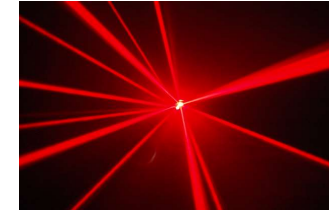
# Absorption of Different Wavelengths of Light (Colors) in Mitochondria



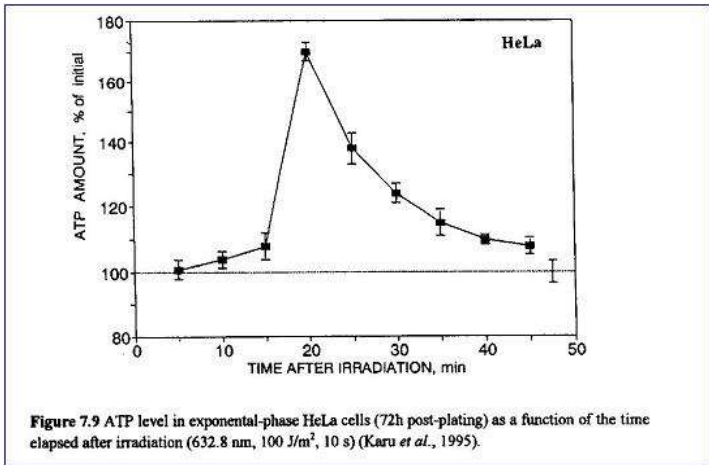
- One example for the absorption of different colors within cells is the process in the mitochondrial respiratory chain [21]
- Complex 1 (NADH dehydrogenase) absorbs blue and ultraviolet light
- Complex 3 (cytochrome c reductase) absorbs green and yellow light
- Complex 4 (cytochrome c oxidase) absorbs red and infrared light



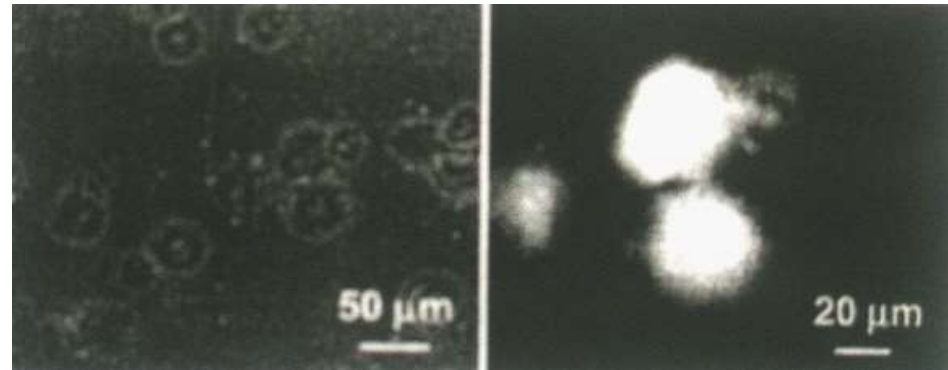
# Effects of Red Light



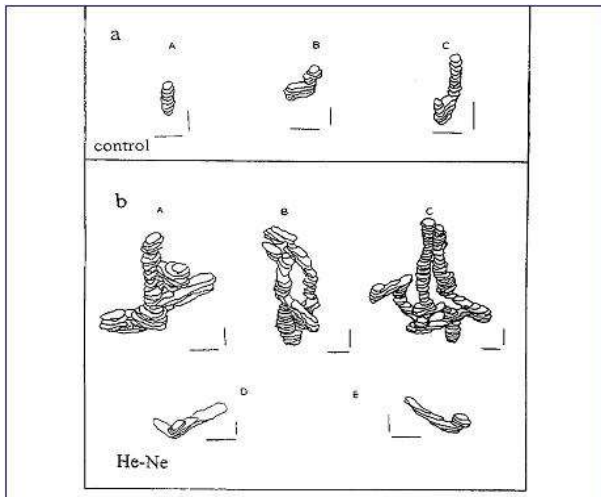
- Positive influence on rheological properties of the blood (58)
- Diminishing tendency of aggregation of thrombocytes and an improved deformability of erythrocytes [10, 29]
- Activation of phagocytic activity of macrophages [9, 26]
- Positive effect on the proliferation of lymphocytes and B- and T-cell subpopulations [13, 58]
- Stimulation of immune response with increase of the immunoglobulins IgG, IgM and IgA [43]
- Stimulation of interferons, interleukins and TNF-alpha [48, 50, 51, 68]
- Hypoxia of the tissue is improved, and fibrinolysis is activated [62]
- Development of so-called "giant mitochondria" with activation of various metabolic pathways, increased production of ATP and normalization of cell membrane potential [36, 55]
- Analgesic, spasmolytic and sedative effects [62, 63]
- Improves microcirculation in central nervous structures with stimulation of the functional activity of the hypothalamus and limbic system, leading to an activation of hormonal, metabolic, immunological and vegetative processes with mobilization of adaptive reserves [11]



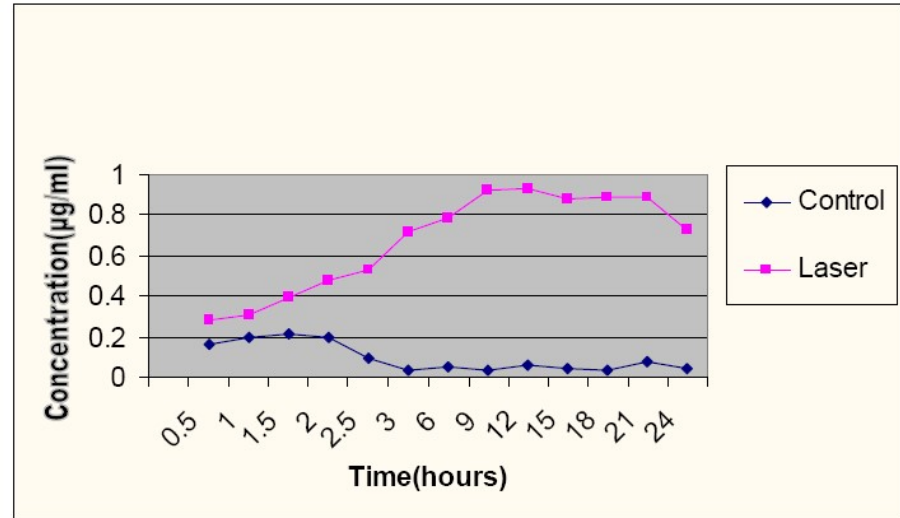
ATP Increase under laser irradiation (632 nm, red light) of a HeLa cell culture



Activation of macrophages

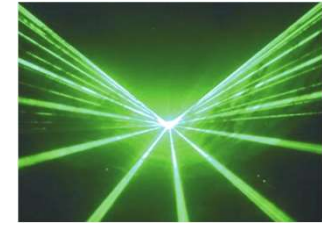


'Giant' mitochondria in human lymphocytes after laser irradiation (632 nm)

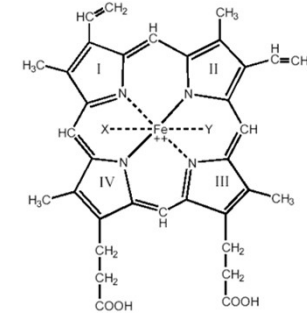


**Figure (1)** Concentration / Time relationship of IgM of both groups  
Effects on the immune system

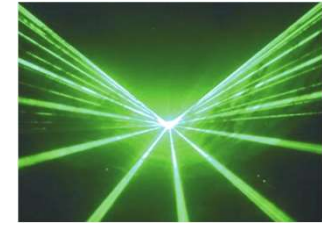
# Effects of Green Light



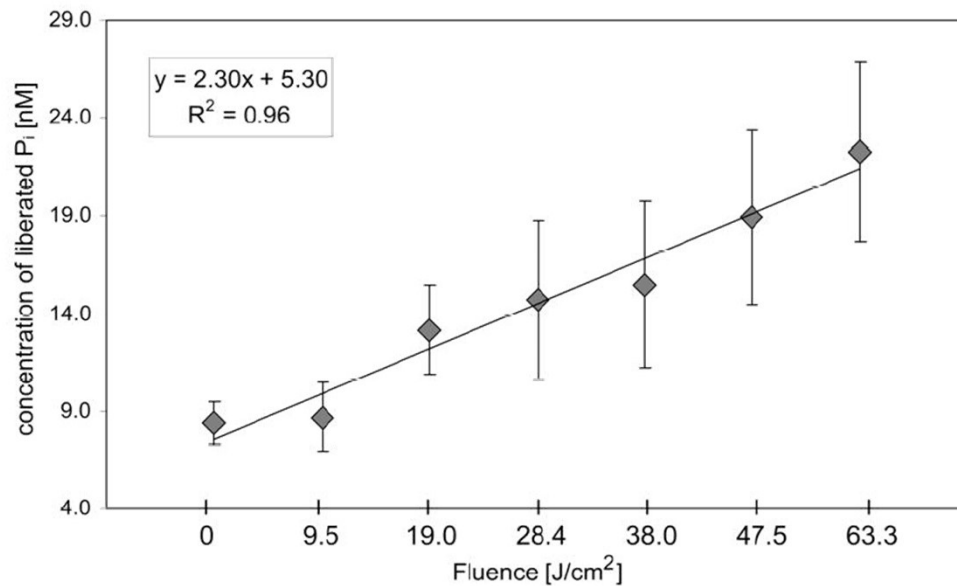
- Green binds to hemoglobin
- Improves the function, behavior and cell elasticity of red blood cells [17, 20, 38, 61]
- Increases oxygen delivery [17, 20, 31, 38, 50]
  - improved oxygen affinity
  - increased attraction of oxygen to hemoglobin
  - Improved ability to carry more oxygen
- Decreases in lactic acid [17, 20]
- Reduces blood viscosity and improves blood flow [31, 38, 50]
- Activates reparative and stabilizing pathways [20, 38, 50]
- Platelet activation with gradual loss of natural platelet reactivity and ability to respond to activating agents [17, 20]
- Positive effect on Sodium/Potassium Pump, which helps to regulate intra- and extra-cellular cation homeostasis [23]



# Effects of Green Light



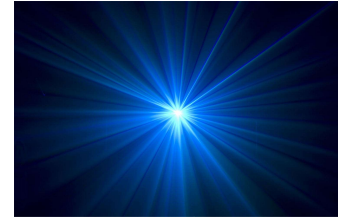
Kassak et al. (2005): Green laser light increases the production of ATP in the irradiated mitochondria by more than 30% [23]



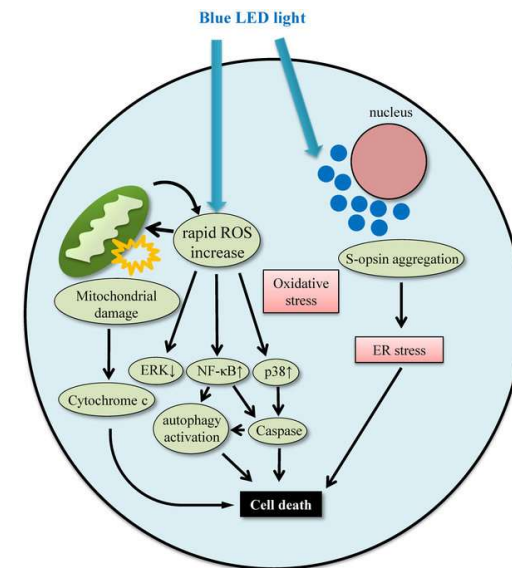
Activity of Na<sup>+</sup>/K<sup>+</sup>-ATPase of red blood cells irradiated with Nd:YAG laser of various fluences. Results are presented as mean ± S.E.M. of the concentration of inorganic phosphate (n=8). Equation of the trend line and coefficient of determination (R<sup>2</sup>) are shown.



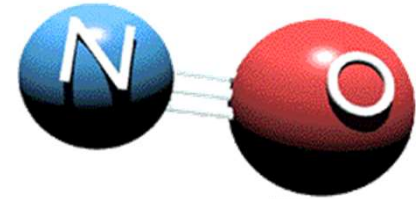
# Effects of Blue Light



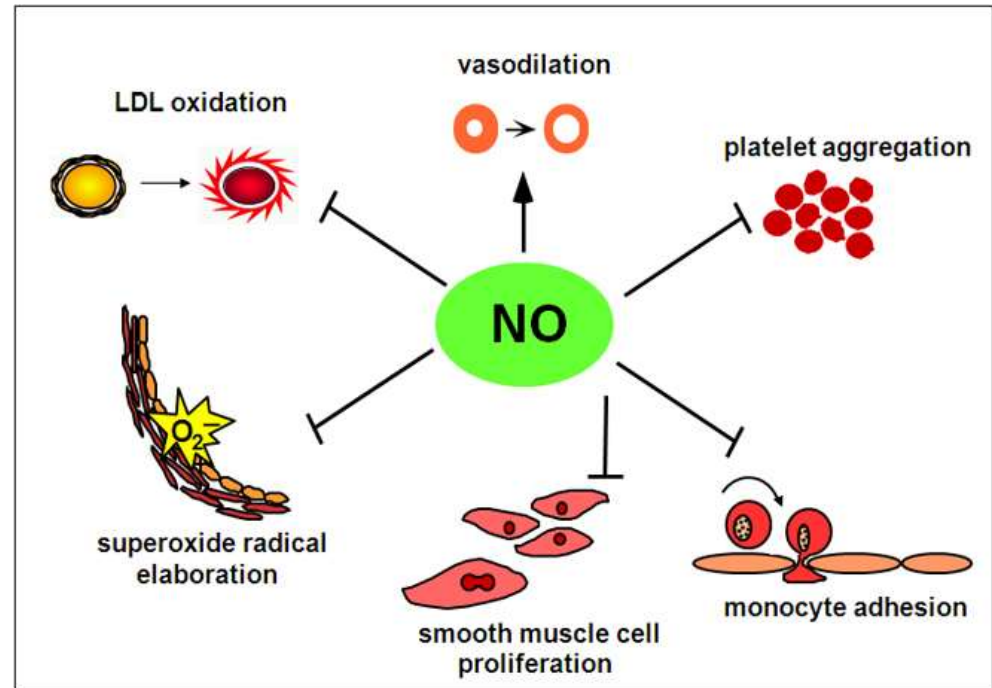
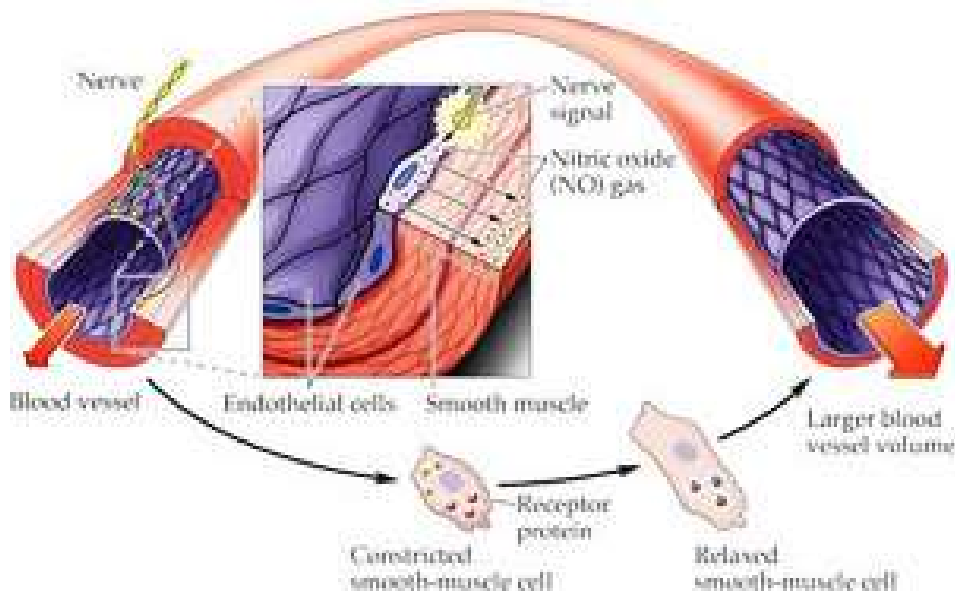
- Blue light **releases nitric oxide (NO) in monocytes with vasodilatation and improvement of endothelial dysfunction** [42]
- NO is known to be a growth, immune, and neuromodulator, as well as a stimulator of stem cell proliferation and it has a critical role in analgesia, vasodilation and angiogenesis through c-GMP pathway
- Increased production of NO is activating the telomerase and thus stopping shortening of telomeres → anti-aging [60]
- Increased NO is lowering blood pressure [42]
- Blue laser is known to act anti-inflammatory by reducing pro-inflammatory cytokines and contributory factors for a variety of conditions (NF- $\kappa$ B, CRP, IL2, IL6, TNF alpha, Leptin, chemokines etc.) [51]
- Blue light is effective for treating infections by production of ROS (especially in combination with photosensitive substances like Curcumin or Riboflavin) [14]



# Nitric Oxide - Mechanisms Of Action

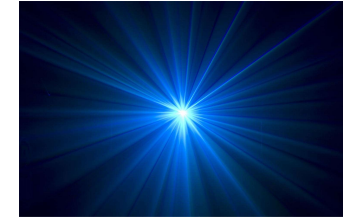


## The Science Behind Nitric Oxide





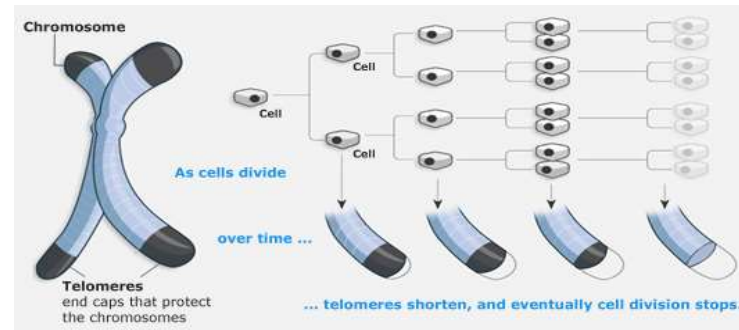
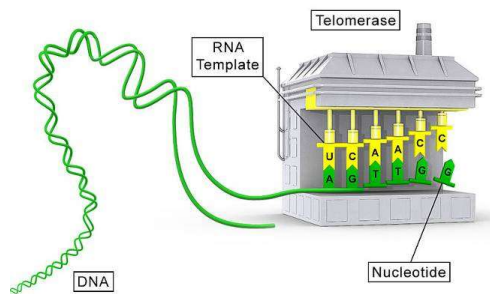
# Anti-Aging Effects of Blue Light



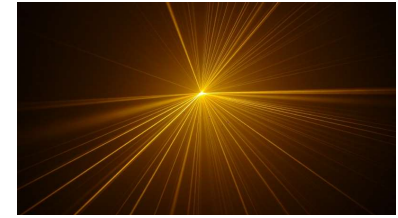
## Nitric Oxide Activates Telomerase and Delays Endothelial Cell Senescence

Mariuca Vasa, Kristin Breitschopf, Andreas M. Zeiher, Stefanie Dimmeler

The repeated addition of the NO donor S-nitroso-penicillamine significantly reduced EC senescence and delayed age dependent inhibition of telomerase activity, whereas inhibition of endogenous NO synthesis had an adverse effect. Taken together, our results demonstrate that telomerase inactivation precedes EC aging. NO prevents age-related downregulation of telomerase activity and delays EC senescence.



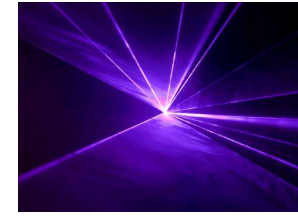
# Effects of Yellow Light



- Improvement of the anti-oxidant enzymatic system with detoxifying effect [50, 51]
- Strong anti-depressive effects (especially in combination with Hypericin from St. John's Wort) and positive influence on the general mood
- Positive effects on pain relief in chronic pain patients
- Improves serotonin and vitamin-D production [50, 51]
- Positive effects on the hormone system [50, 51]



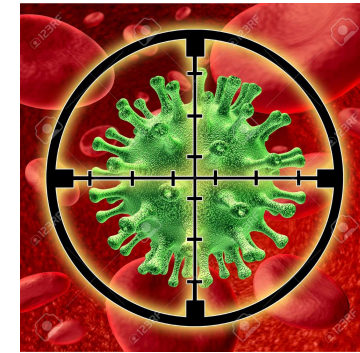
# Effects of UV Light



Experience has shown that ultraviolet blood irradiation can strengthen the immune system and improve overall health [39, 40, 41, 46, 47, 49].

Ultraviolet blood irradiation has been shown to have the following therapeutic benefits:

- Increases oxygen absorption into body tissues
- Destroys fungal, viral, and bacterial growth
- Improves circulation and decreases platelet aggregation
- Improves circulation by dilating blood vessels
- Improves the body's ability to detoxify and inactivate or remove toxins
- Activates cortisone-like molecules, sterols, into vitamin D
- Restores normal size and movement of fat elements

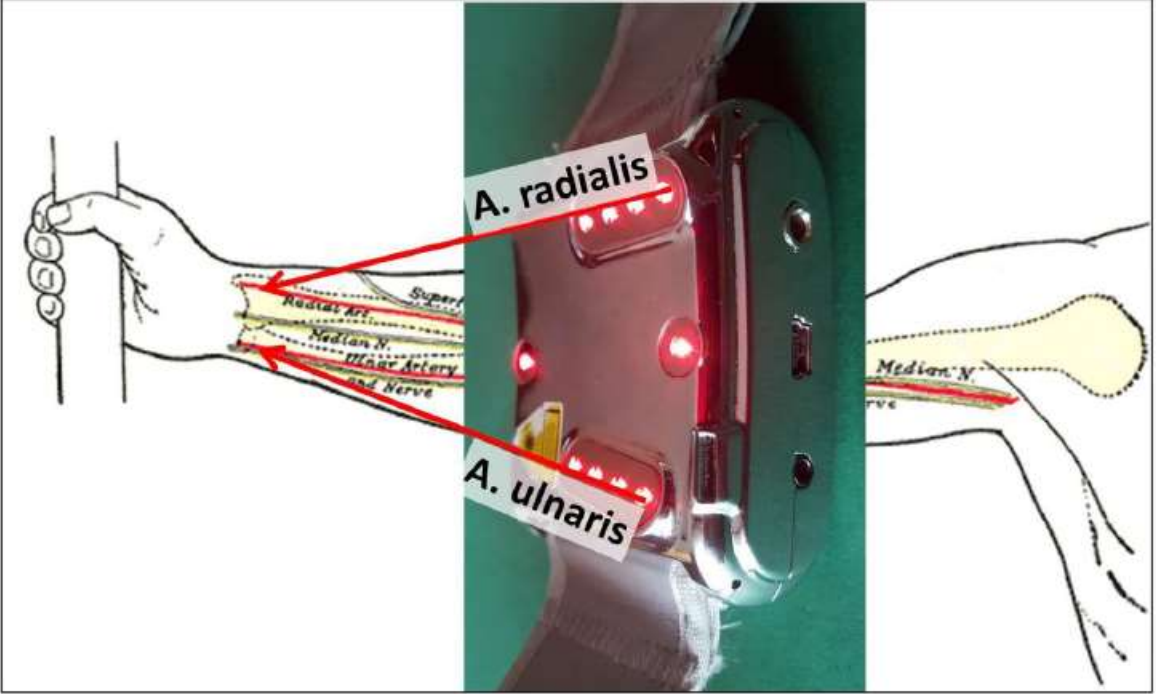


## How UV Works



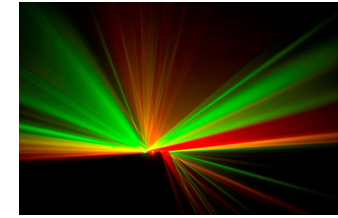
The molecular structure of the DNA is broken down rendering the microbe harmless

# Laser Watch: 1st generation



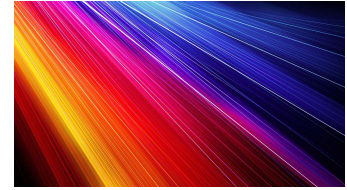
Laser Watch should be used once or twice per day for 30-60 min.

# Weber Medical Laser Watch **Active+** Red and Green Diodes

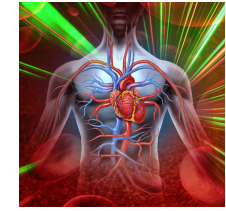




# Weber Medical Laser Watch **Spectra** Red, Green, Blue and Yellow Diodes



# Weber Medical Laser Watch: Attachments



## **Pain & Muscle Tension**

Red light has analgesic, spasmolytic and sedative effects [62, 63]. Yellow light alleviates (chronic) pain syndromes.

## **Skin**

Blue light acts anti-inflammatory by reducing pro-inflammatory cytokines and contributory factors for a variety of conditions (NF-kB, CRP, IL2, IL6, TNF alpha, Leptin, chemokines etc.) [51]. Red light improves oxygen delivery to tissue [62].



## **Hearing loss, Tinnitus**

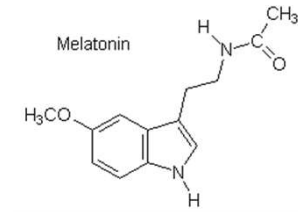
A lack of the vital cell energy ATP (adenosine triphosphate) can lead to tinnitus. An undersupply results in cell damage and subsequently in cell death. The laser boosts cell metabolism by enhancing ATP production and supports healing processes of degenerative diseases. It also improves microcirculation in tissues and accelerates cell growth [71].



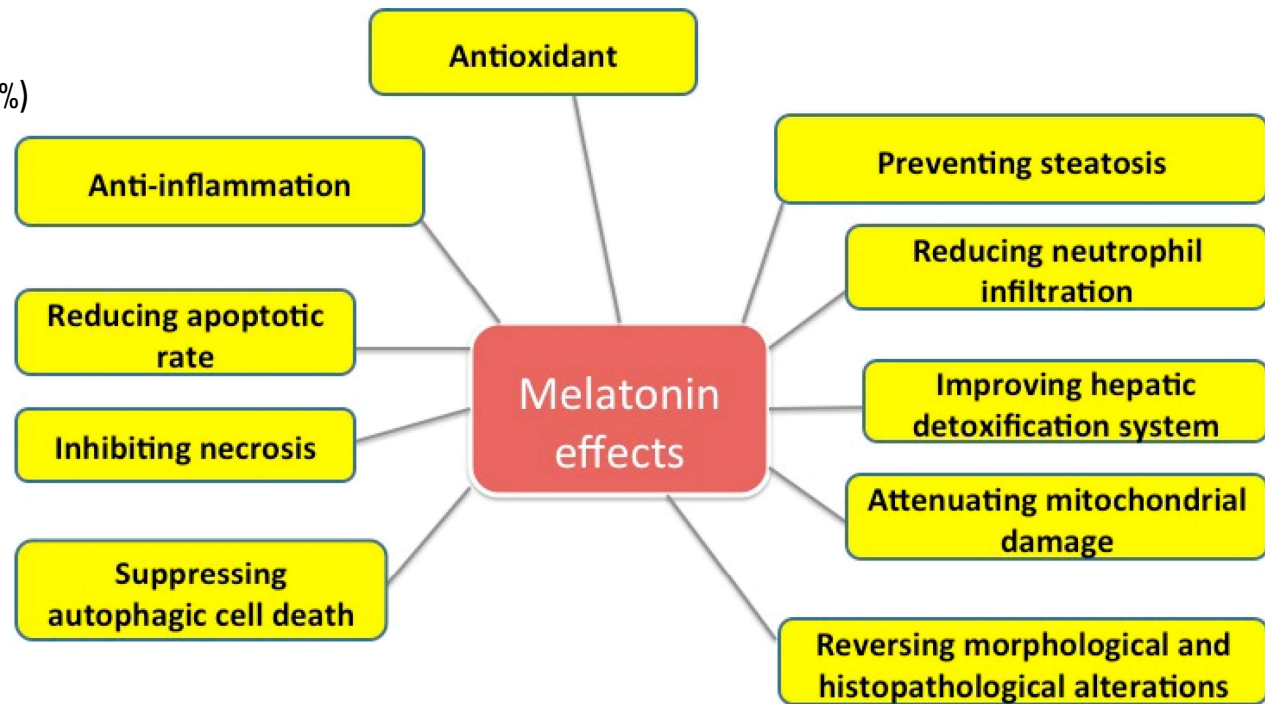
## **Intranasal blood irradiation, relief from rhinitis, sinusitis and allergic reactions**

In case of colds red light can support the decongestion of the nasal mucosa. Furthermore, red light inhibits histamine release and reduces the reaction of the immune system cells to allergens. Due to the many fine blood vessels inside the nose the intranasal application is ideal for external blood irradiation [72, 73].

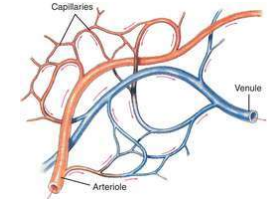
# Studies (1): First Observations (Red Laser)



- Significant increase of Melatonin (30-100 %)
- Increase of Serotonin (50-100 %)
- Improved sleep quality
- Less fatigue



# Studies (2): Microcirculation and ANS (Red Laser)



Daniela Litscher und Gerhard Litscher (2015): LASER WATCH – SIMULTANEOUS LASER ACUPUNCTURE AND LASER BLOOD IRRADIATION AT THE WRIST

## Laseruhr Mikrozirkulation

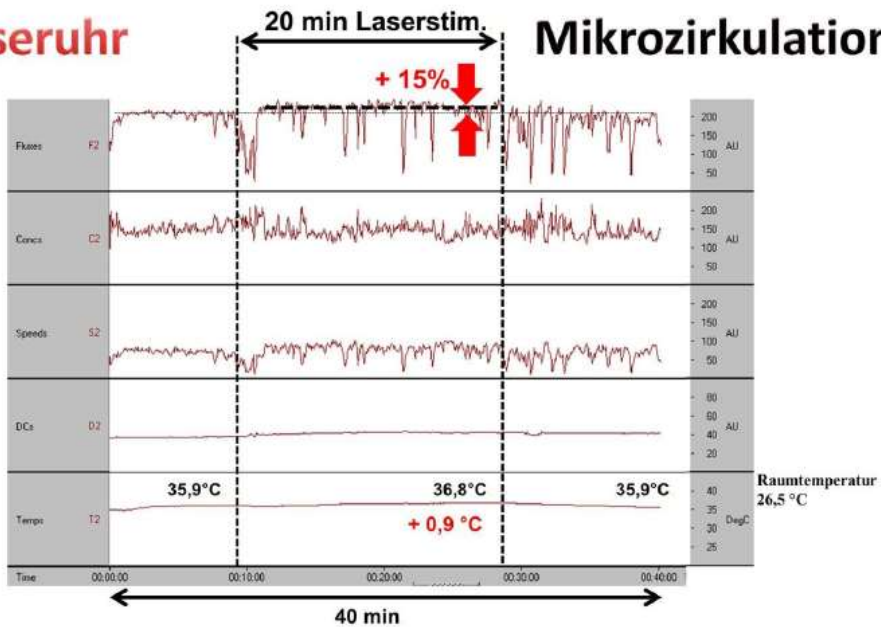


Diagram:  
 Laser watch    20 minute laser stimulation    Microcirculation  
 Room temperature

## Herzratenvariabilität (HRV)

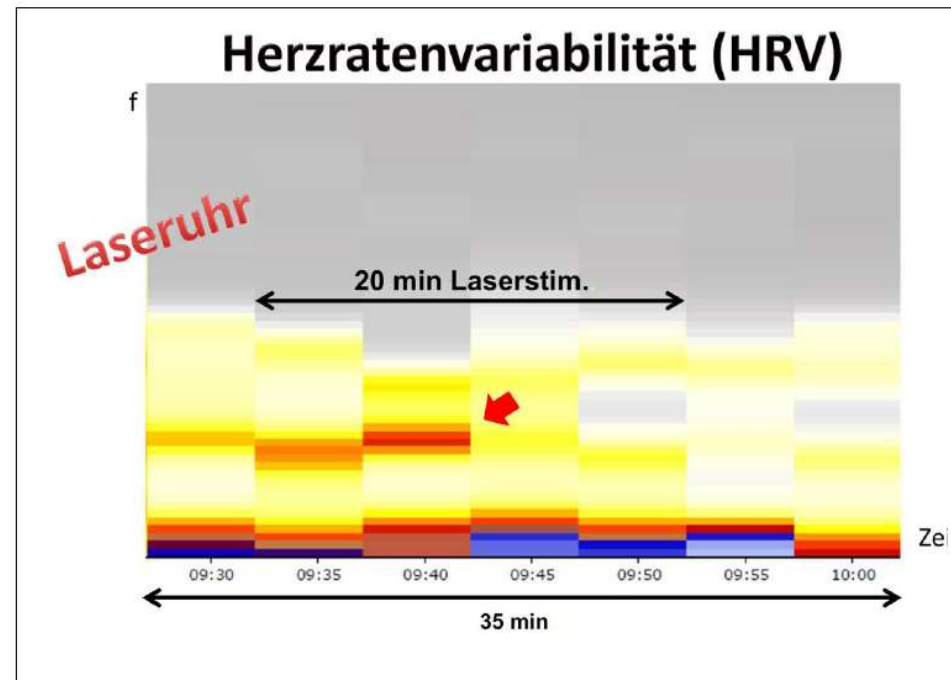


Diagram:  
 Heart Rate Variability (HRV)  
 Laser watch  
 20 minute laser stimulation  
 Time

## Studies (3): Multi-Center Study Switzerland



Dr. med. Andreas Wirz-Ridolfi, Switzerland (2016):

- 20 patients (12 male, 8 female), Age: between 18 and 76 years
- 2 patients with type 1 diabetes
- 18 patients with type 2 diabetes
- **Red laser watch (1st generation) was used**
- **Tested on blood pressure, cholesterol and liver values**

# Studies (3): Multi-Center Study Switzerland



## Results: Blood pressure

Highest value:

**Before:** 170/90,      **After:** 140/85 mmHg

Lowering of blood pressure in average:

Systolic 10,04, Diastolic 6,54 mmHg

**In percentage: 7,9 %**



# Studies (3): Multi-Center Study Switzerland

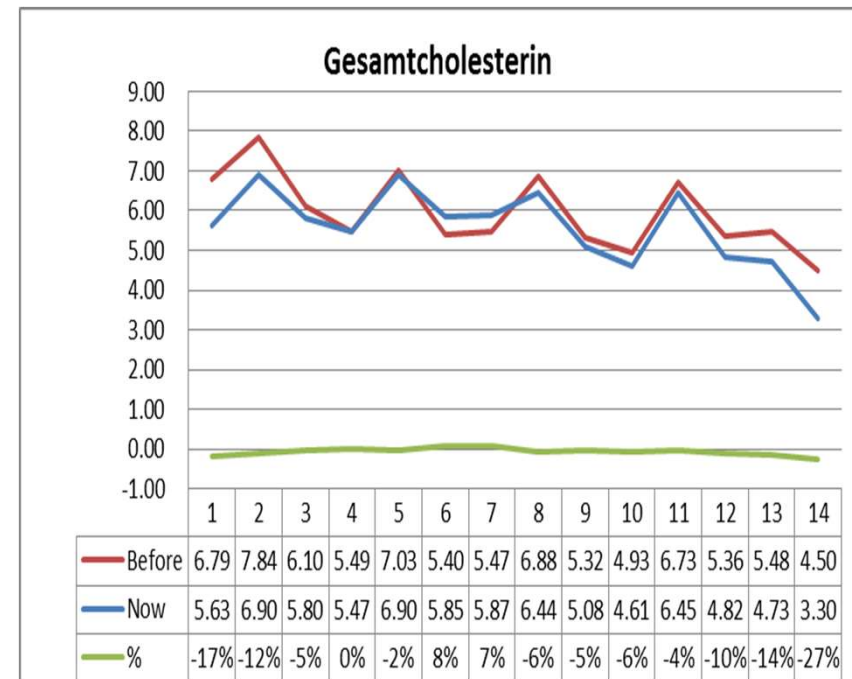


## Results: Cholesterol

Average before: 5,95,      After: 5,5mmol/l

Lowering in average: - 0,39 mmol/l

In percentage: - 6,6 %



# Studies (3): Multi-Center Study Switzerland

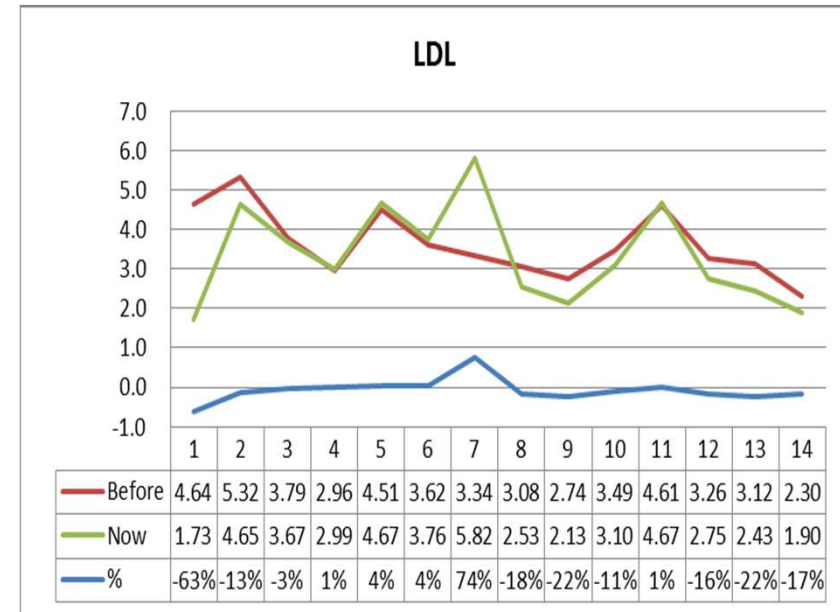


## Results: Lipids (LDL)

Average before: 3,63      After: 3.34 mmol/l

Lowering in average: - 0,28 mmol/l

In percentage: - 7,8 %





# Studies (3): Multi-Center Study Switzerland



## Results: Liver (GPT)

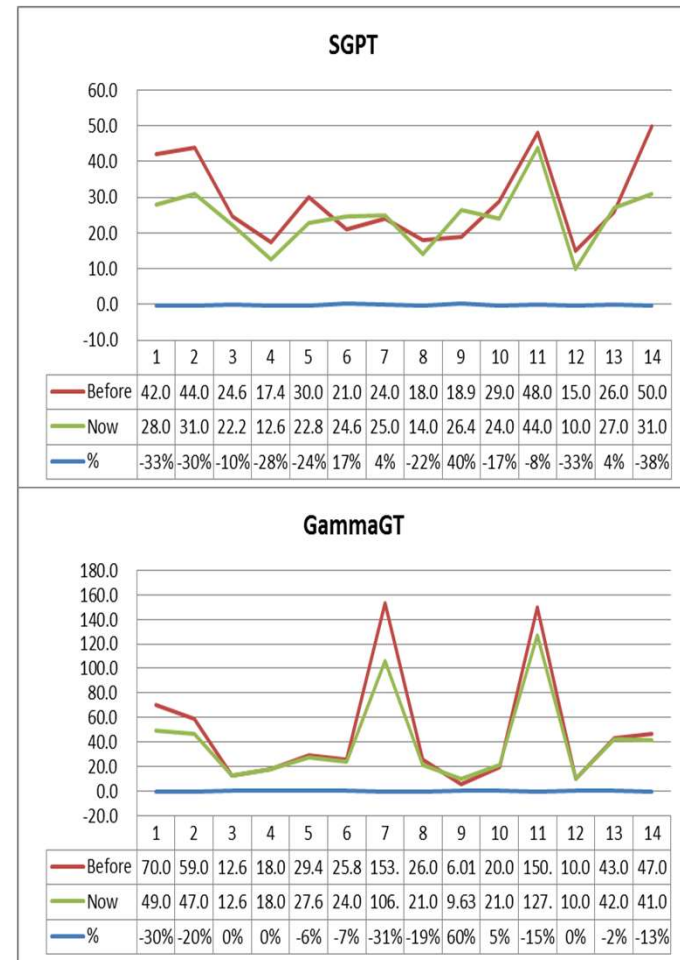
Average before: 29,14 IU/l.      After: 24,47 IU/l  
 Lowering in average: - 4,66 IU/l

In percentage: - 16,0 %

## Results: Liver (GammaGT)

Average before: 47,84 IU/l,      After: 39,70  
 Lowering in average: - 8,14 IU/l

In percentage: - 17,0 %



# Studies (4): Diabetes (Case Report)

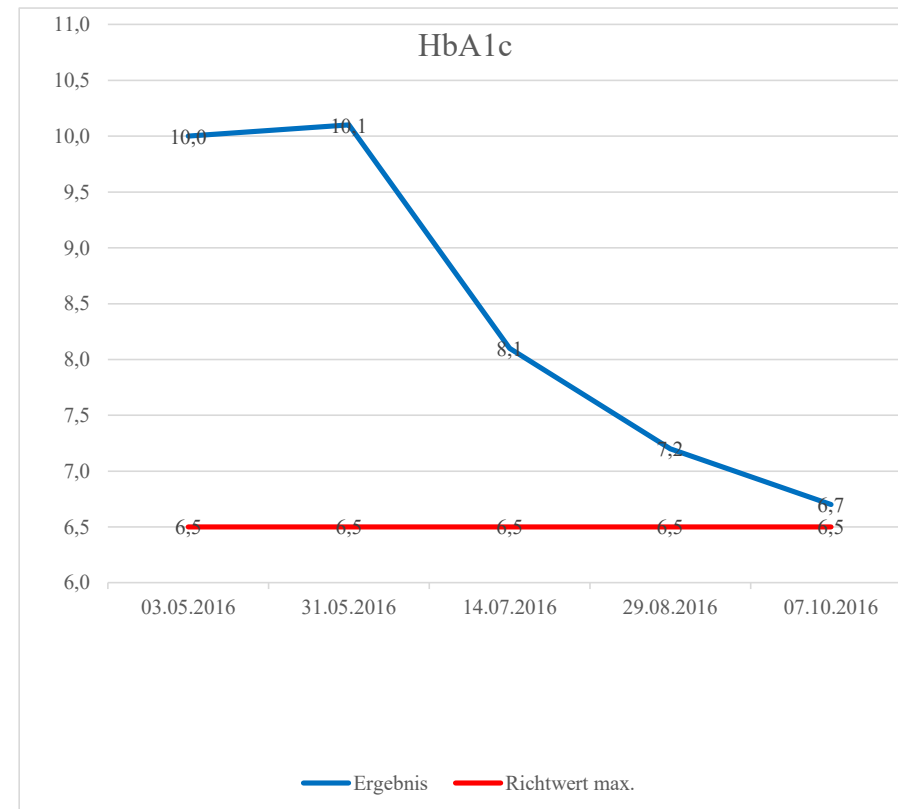


**Patient, 62 years, male**

**Diagnosis:** Diabetes Typ 2, Hypertension; regular therapy with Metformin 2 x 1000 mg, Candesartan 32 mg

## Therapy with Laser Watch:

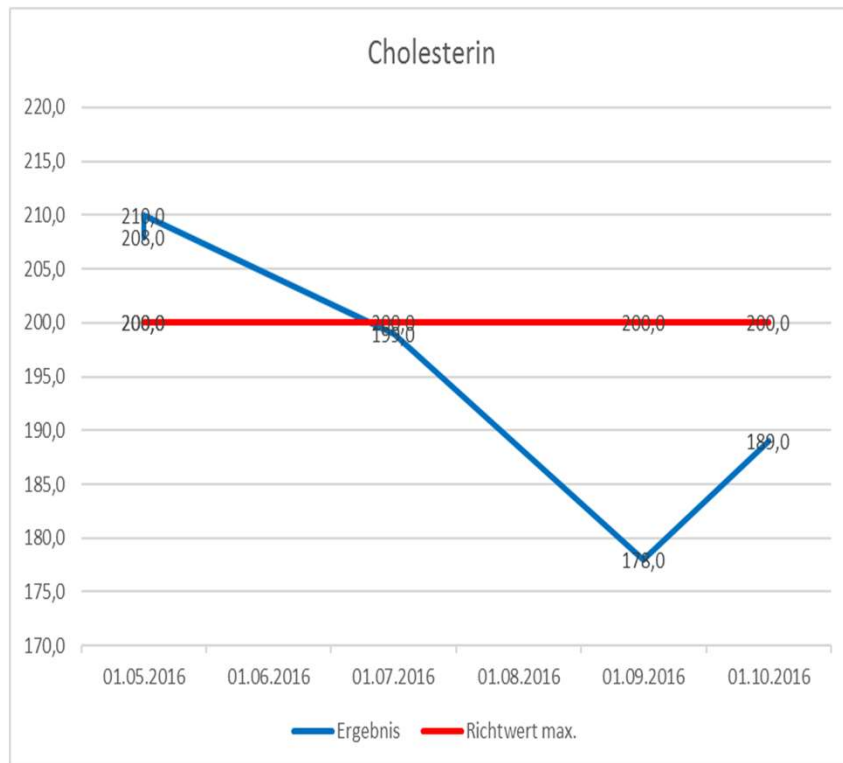
- 1) 3 month red laser watch
- 2) 3 months red-blue laser watch in combination with Curcumin (Ultracur+)



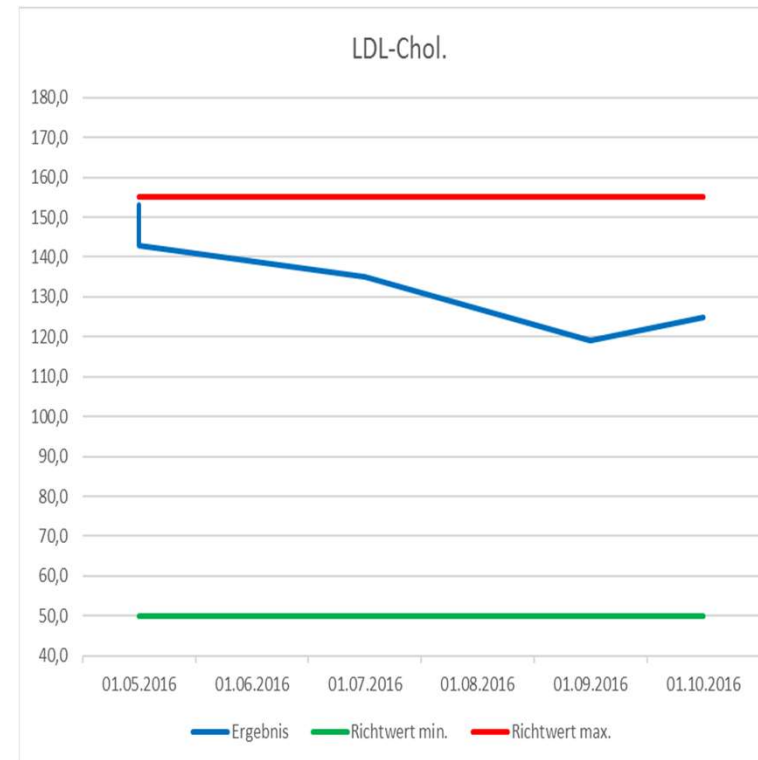
# Studies (4): Diabetes (Case Report)



## Cholesterol:



## LDL-Cholesterol:





# Case Studies Laser Watch



Pain treatment: Significant relief in pain patients

**Female, 52 years old**

**Diagnosis: Migraine**

*Rapid pain relief, painkillers are no longer necessary.*

Single use for 30 min.

**Male, 76 years old**

**Diagnosis: Tension headaches**

*Quick improvement.*

Single use for 30 min. High intensity

**Female, 74 years old**

**Diagnosis: Carpal Tunnel Syndrome**

*Significant pain relief.*

Multiple use for 30 min. High intensity

**Male, 78 years old**

**Diagnosis: Shoulder pain, left**

*Pain is completely gone.*

Three-day application for 30-60 min.

**Female, 74 years old**

**Diagnosis: Osteoarthritis in the ankle**

*Significant pain relief.*

Multiple use for 30 min. High intensity

**Female, 63 years old**

**Diagnosis: TMJ Pain, Trigeminal neuralgia**

*Strong reaction to laser.*

Single use for 10 min. Low intensity

**Female, 30 years old**

**Diagnosis: Bursae and tendinitis in the shoulder**

*Pain and feeling of heat are completely gone.*

Seven-day use, 2 times/day for 60 min.

Significant reduction in ocular tension in **glaucoma patients**

The combination of red and green light **stimulates ATP production** very effectively

→ Patients confirm to feel more active / energetic

# Summary: Main Effects of the Laser Watch



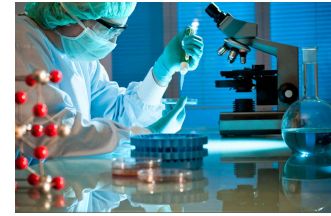
- Boosting cellular energy by increase of ATP synthesis
- Immune system stimulation
- Improvement of microcirculation and reduction of blood viscosity
- Activation of macrophages
- Positive effects on heart and metabolism
- Improves the function, behavior and cell elasticity of red blood cells
- Increases oxygen delivery
- Activates reparative and stabilizing pathways
- Releases nitric oxide (NO) and activates telomerase
- Brings down blood pressure
- Reduces inflammations
- Pathogen deactivation (effective against bacteria and viruses)
- Detoxifying effects
- Positive influence on the general mood (strong anti-depressive effects)
- Improves Serotonin and Vitamin-D production
- Pain relief
- Positive effects on the hormone system
- Activation of stem cells

# Areas of Application



- Internal Diseases (Diabetes, chronic liver and kidney diseases)
- Metabolic disorders
- Cardiovascular diseases
- Allergies
- (Chronic) Inflammation
- Hypertension
- Auto-immune diseases
- Sleep improvement
- Prevention of jet lag and thrombosis
- Immune system strengthening
- Tinnitus
- Depression, fatigue-syndrome and burn-out
- Anti-Aging
- General performance increase (in sports)
- Additive Cancer Therapy (in combination with photosensitizing agents) and prevention

# PDT for Covid-19 Management



# PDT for Covid-19 Management



## Successful Reduction of SARS-CoV-2 Viral Load by Photodynamic Therapy (PDT) Verified by QPCR – A Novel Approach in Treating Patients in Early Infection Stages

Hans Michael Weber<sup>\*1</sup>, Yasaman Zandi Mehran<sup>2</sup>, Armin Orthaber<sup>3</sup>, Hadi Hosseini Saadat<sup>4</sup>, Robert Weber<sup>5</sup> and Matthias Wojcik<sup>6</sup>

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# PDT for Covid-19 Management



## Definition of infection stages for our study rationale

The treatment presented in this study is recommended in early stage of disease:

- where the treatment can be done by the patient at home or by supervision of a local physician
- for prevention of hospitalization, intubation, artificial respiration, and late disease complications.

# PDT for Covid-19 Management



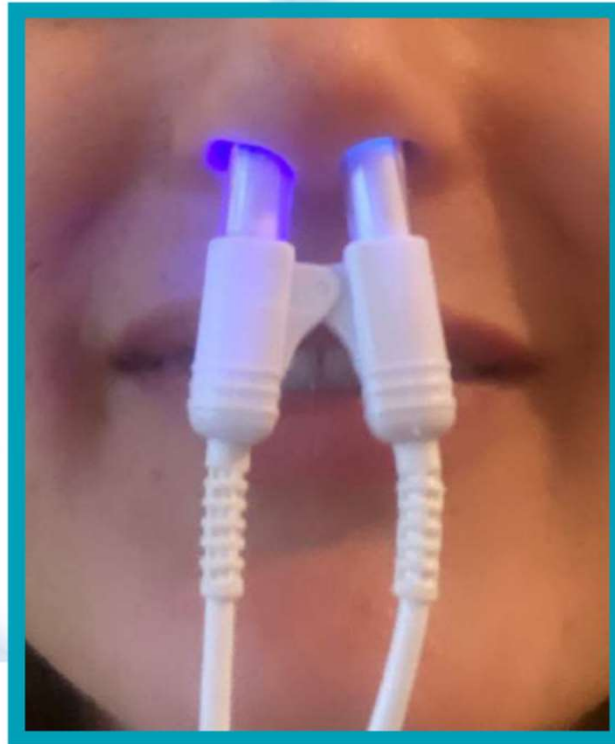
## Treatment Protocol:

1. Take 1 capsule of Riboflavin-5-Phosphate (100 mg)
2. Wait for 1 hour while the Riboflavin is absorbed
3. Start systemic treatment with the Spectra Laser Watch (duration = 1 hour)
4. At the same time open a 2nd capsule and dissolve in a glass of water (200ml)
5. Fill up the spray bottle with the Riboflavin solution
6. Spray 3 times into both nostrils
7. Rinse the mouth intensively with the remaining solution and gargle
8. Wait for 15 min while Riboflavin is absorbed
9. Treat nose, mouth and throat for 20 min

# PDT for Covid-19 Management



# PDT for Covid-19 Management



# First Covid-19 Study (2020):



We treated 20 patients aged 18-80 years who tested positive for Covid-19 and were under medical treatment for severe clinical symptoms such as fever, cough, chest pain, fatigue, etc., but did not yet require intubation or oxygenation.

PDT treatment was performed once daily for 5 days.

At the same time, a control group was formed for comparison, in which the patients received conventional therapy according to the current Covid-19 recommendations.

The viral load of the patients (Ct value) was used as the main parameter for follow-up diagnostics. In addition, clinical symptoms were documented.

# First Covid-19 Study (2020):



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# First Covid-19 Study (2020):





# First study results:



Experiment group		SYMPTOMS							
Gender	Case number	FEVER	DRY COUGH	HEADACHE	HARD BREATHING, OR CHEST PAIN OR CHEST PRESSURE	FATIGUE OR TIREDNESS	SLEEP DISORDER	LOSS OF TASTE OR SMELL	How many days before you felt bad
F	1	■	■		■	■	■	■	5
M	2	■	■			■		■	7
F	3	■	■		■	■		■	5
F	4	■	■		■	■	■	■	3
F	5	■	■		■	■	■	■	3
F	6	■		■	■	■	■	■	4
M	7	■	■	■	■	■	■	■	7
F	8	■	■		■	■		■	7
M	9	■	■		■	■			7
M	10	■	■		■	■		■	8
M	11	■	■		■	■		■	3
F	12	■	■	■	■	■	■	■	2
M	13				■	■		■	4
F	14	■			■	■			3
F	15	■		■	■	■	■	■	4
F	16	■	■	■	■	■	■	■	5
F	17		■	■	■	■	■	■	2
F	18	■	■	■	■	■	■	■	4
M	19	■	■	■	■	■		■	5
F	20	■	■	■	■	■	■	■	3

**Table 1: Symptoms of 20 patients in the experiment (verum) group before therapy**

# First study results:



Experiment group		SYMPTOMS						
Gender	Case number	FEVER	DRY COUGH	HEADACHE	HARD BREATHING OR CHEST PAIN OR CHEST PRESSURE	FATIGUE OR TIREDNESS	SLEEP DISORDER	LOSS OF TASTE OR SMELL
F	1		■		■	■	■	■
M	2					■		■
F	3							■
F	4						■	■
F	5		■				■	■
F	6			■				■
M	7		■	■				■
F	8					■		■
M	9					■		
M	10				■	■		■
M	11		■		■	■		■
F	12		■	■		■	■	■
M	13					■		■
F	14							
F	15			■				■
F	16			■	■			■
F	17				■	■	■	■
F	18					■	■	■
M	19					■		■
F	20		■			■	■	■

**Symptoms of the experiment (verum) group after 5-day PDT**

# First study results:



## Clinical symptoms in the Control Group:

The 20 patients from the control group who received treatment at the same clinic but did not receive additional PDT showed little significant improvement in clinical symptoms:

2 patients had to be transferred to the intensive care unit; after 5 days, 10 of the remaining 18 patients still had fever. 15 of 18 patients were still suffering from a severe cough and 14 of 18 were still experiencing breathing problems and chest pain.

# First study results:



## Viral Load measurements:

The Ct value (cycle threshold) measured in QPCR tests can be interpreted as the amount of viral RNA in the subject.

The higher the Ct value found, the lower the original virus concentration in the sample tested.

**Ct values of  $> 30$  are considered to indicate a low virus concentration, values of  $> 35$  a very low virus concentration.**

In addition to be an indicator for severity of disease, the virus concentration also determines how infectious an infected person is. A high virus concentration in the nasopharynx is usually an indicator for high infectivity.

# First study results:



Experiment group			QPCR CYCLE THRESHOLD VALUE							
AGE	Gender	Case number	PRE DAY0	AFTER DAY1	AFTER DAY2	AFTER DAY3	AFTER DAY4	AFTER DAY5	DAY6 NO TREATMENT	DAY7
49	F	1	+	37.2	38.9	Negative	Negative	Negative		Negative
52	M	2	+	35.2	34.5	36.8	37.8	Negative		Negative
24	F	3	+	28.3	30.3	35.7	35.1	Negative		Negative
18	F	4	+	35.1	39.3	Negative	Negative	Negative		Negative
37	F	5	+	28.3	30.5	32.2	35.2	Negative		Negative
27	F	6	+	29.8	30.2	31.2	33.4	Negative		Negative
40	M	7	+	29.7	29.2	35.4	37.2	Negative		Negative
57	F	8	+	29.2	29.2	34.3	37.8	Negative		Negative
50	M	9	+	22.7	27.3	25.6	30.1	33.7		35.1
31	M	10	+	27.1	30.2	32.2	36.7	Negative		Negative
53	M	11	+	23.9	24.6	27.7	34.4	35.1		34.1
80	F	12	+	34.6	Negative	Negative	38.8	39.1		Negative
39	M	13	+	34.1	35.7	38.8	39.1	Negative		Negative
25	F	14	+	24.1	26.6	29.7	35.7	Negative		Negative
50	F	15	+	26.7	28.8	33.4	37.2	Negative		Negative
67	F	16	+	35.5	34.3	36.7	38.1	Negative		Negative
39	F	17	+	35.4	37.1	38.9	39.2	Negative		Negative
45	F	18	+	31.2	32.9	35.4	35.5	37.2		38.1
39	M	19	+	21.4	25.2	23.4	26.9	32.2		34.2
37	F	20	+	23.6	27.9	25.4	26.2	29.7		30.3

Test results with Ct values in the experiment (verum) group

# New study results (02/2021):



Number of patients: 70 in PDT group, 70 in control group

PDT group:

- 35 out of 70 patients (= 50 %) had a negative test result after PDT
- Average increase of the Ct value from 28.46 to 37.19
- No intensive care treatments necessary

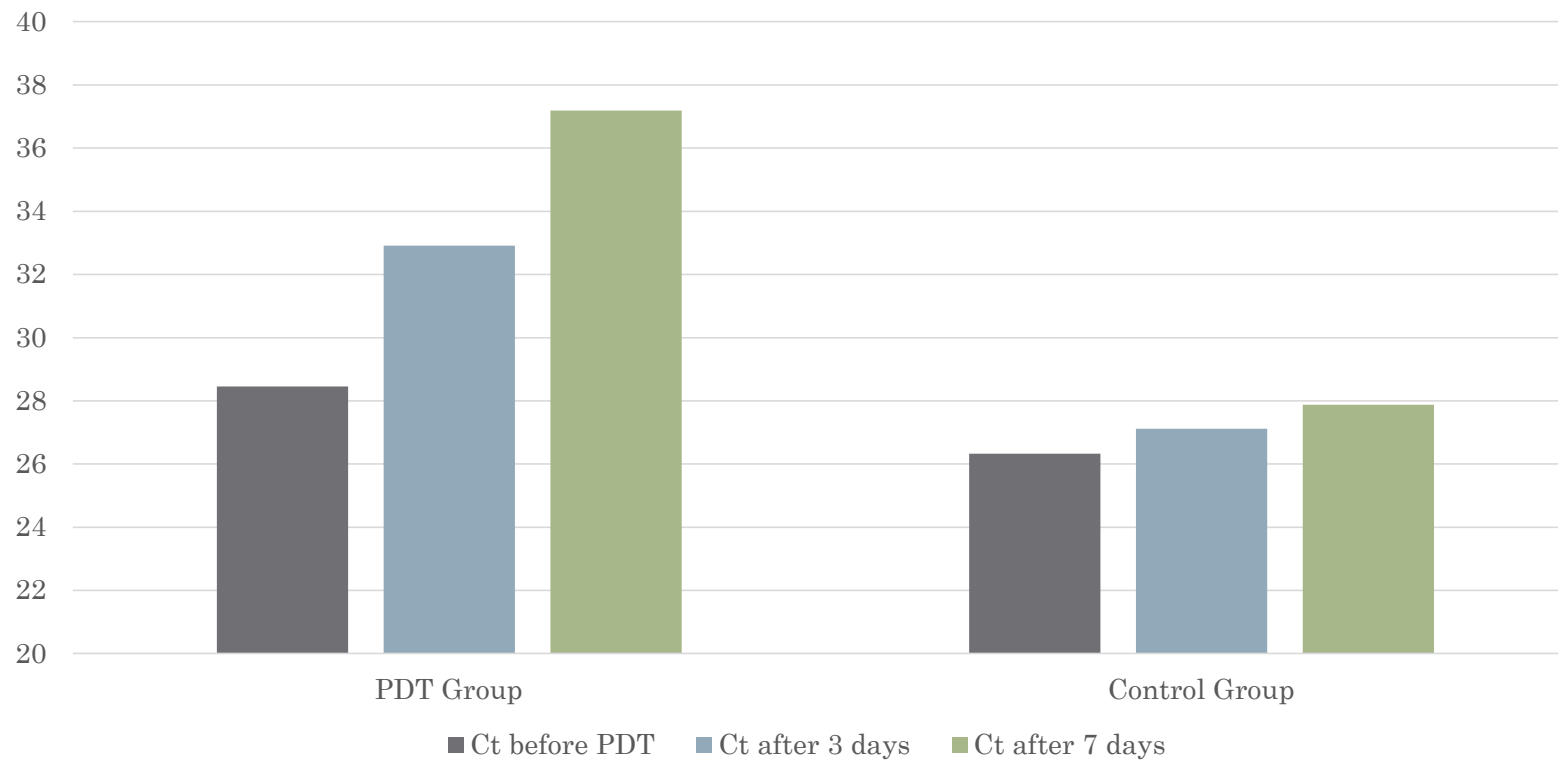
Control group:

- No negative test results after 7 days
- No significant changes in average Ct value (from 26.33 to 27.88)
- Intensive care treatments necessary in some patients

# New study results (02/2021):



Viral Load Measurement (Ct value)



# Conclusion:



- In all patients treated with PDT, the viral load was significantly reduced within a few days, in 50% of the patients even to such an extent that a negative test result was already available after the treatment course. At the same time, a strong decrease of the clinical symptoms could be observed in all 20 patients.
- In comparison, in a control group of 20 patients receiving conventional drug therapy, there was no significant decrease in viral load or clinical symptoms within 5 days, while 2 patients even required intensive care.
- The PDT treatment is free of side effects, inexpensive and can be applied by the patients themselves.
- PDT is expected to be effective against other cold and flu viruses or bacteria.



# EndoLight<sup>®</sup> Band

RECHARGE. RELAX. RECOVER.



# Spectra Watch vs. EndoLight® Band



## Spectra Watch:



- Developed in 2015
- 10 Laser & LED diodes (max. 5 mW)
- Colors: red, blue, green, yellow
- Free selection of mode, treatment time and power > confusion
- Recommended treatment time: 60 mins/day
- Heavy and clumsy

## EndoLight® Band:

- Brand-new development: 08/2022
- 8 **LASER** Diodes\* (**35 mW**) – **more power, more effective**, *\*except for yellow (LED)*
- Colors: red, blue, green, yellow + **INFRARED**
- 3 pre-installed settings > **intuitive handling**
- Time saving: **30 mins/day** for optimum effects
- Light materials and neat **design**
- Contact sensor for **user security**

### Irradiation of Arteria Radialis

Red

Infrared



660  
nm

660  
nm

808  
nm

808  
nm

Adjustable output:

25 % | 50 % | 75 % | 100 %

Increased safety due to contact sensor; Diodes are only activated when close to skin.

Use of optic lenses and glass matting to direct the light specifically.



### Irradiation of Arteria Ulnaris

Yellow

Green

Blue



590  
nm  
(LED)

505  
nm

450  
nm

450  
nm

Audible signal indicates when skin contact has been interrupted or the session has ended.

# Spectra Watch vs. EndoLight® Band



Open Access

*OBM Integrative and  
Complementary Medicine*

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Editorial

**Laser Watch—New Generation 2021: Modern Integrative Photomedicine  
Equipment for Photobiomodulation**

Gerhard Litscher \*

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A pilot measurement of the changes in regional oxygen saturation (rSO<sub>2</sub>) was performed with an INVOS 5100C Oximeter (Somanetics Corp., Troy, MI, USA) on October 14, 2021 (Figure 3a). In this measurement, near-infrared light (730 nm and 805 nm) was made to pass through the skin at the crook of the elbow (Figure 3b), and, after passing through different kinds of tissue, the reflected light was detected at two distances from the light source (3 cm and 4 cm). The spectral absorption of the blood in deeper structures (2–4 cm) was determined and defined as the rSO<sub>2</sub> values [15].

### 3. Preliminary Results

The purpose of this preliminary measurement, which was carried out with near-infrared spectroscopy (NIRS), was to investigate peripheral  $rSO_2$  for the first time, before, during, and immediately after laser watch stimulation. The results indicate that the  $rSO_2$  values were significantly higher during laser watch blood irradiation of the radial and ulnar artery with the different available wavelengths (see methods section) as compared to the baseline values before stimulation (Figure 4).



**Figure 4** Continuous  $rSO_2$  measurement values in percentage before, during, and after laser watch stimulation at the wrist of the left arm, which was recorded in the crook of the left elbow. Note the increase during the stimulation period with a duration of about 10 min.

# Heart rate variability observation

Patient 1



Patient 2



Patient 3



The sympathetic nervous system is characterized by an increase in performance and is activated, for example, in times of stress and emergency situations. The baseline data is measured at rest and in a sitting position, therefore the sympathetic nervous system should be significantly lower than the parasympathetic nervous system as the measurement environment does not reflect a fight or flight situation.

The parasympathetic nervous system is used for regeneration, building up strength reserves and enhancing metabolic processes.

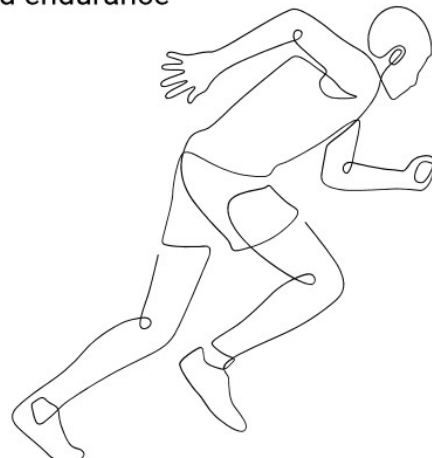
Conclusion: After wearing the EndoLight®, the activity of the sympathetic nervous system decreased significantly. The activity of the parasympathetic nervous system, on the other hand, increased. This creates an environment that allows the innate regulatory mechanisms in the body to thrive.



# General observations of first test persons

## After using the EndoLight® in Recharge mode

- Reduction of fatigue: "No more afternoon slump."
- "During shift work and start the day much peppier since I've been using the EndoLight® regularly."
- When I know I have a busy day ahead of me, I use the EndoLight® on the "Recharge -Program" right after I get up - it gives me a real energy boost and can even replace the first cup of coffee for me."
- "I have significantly more strength and endurance when exercising."



## After using the EndoLight® in Relax mode

- "I can really feel myself "coming down" and my body recovering."
- "The EndoLight® helps me wind down and sleep peacefully during a very stressful work week." (30 min. in "Relax Mode" before sleep).

## After using the EndoLight® in Recover mode

- "My cold was over quicker than I'm used to. I usually have to deal with the symptoms for much longer."
- My work requires regular overseas business trips. Since I have been wearing the EndoLight® before and immediately after the flight, I have been able to keep jet lag to a minimum."



## EndoLight® Band Testimonials/Feedback:



“In addition to other benefits I feel I'm receiving from it, ever since I had covid about 4 months ago, my eyes have felt dry and a bit irritated and have been tending to be bloodshot. I realized the other day that they have been feeling better the past couple weeks or so, and the only thing that has changed is using the EndoLight.”

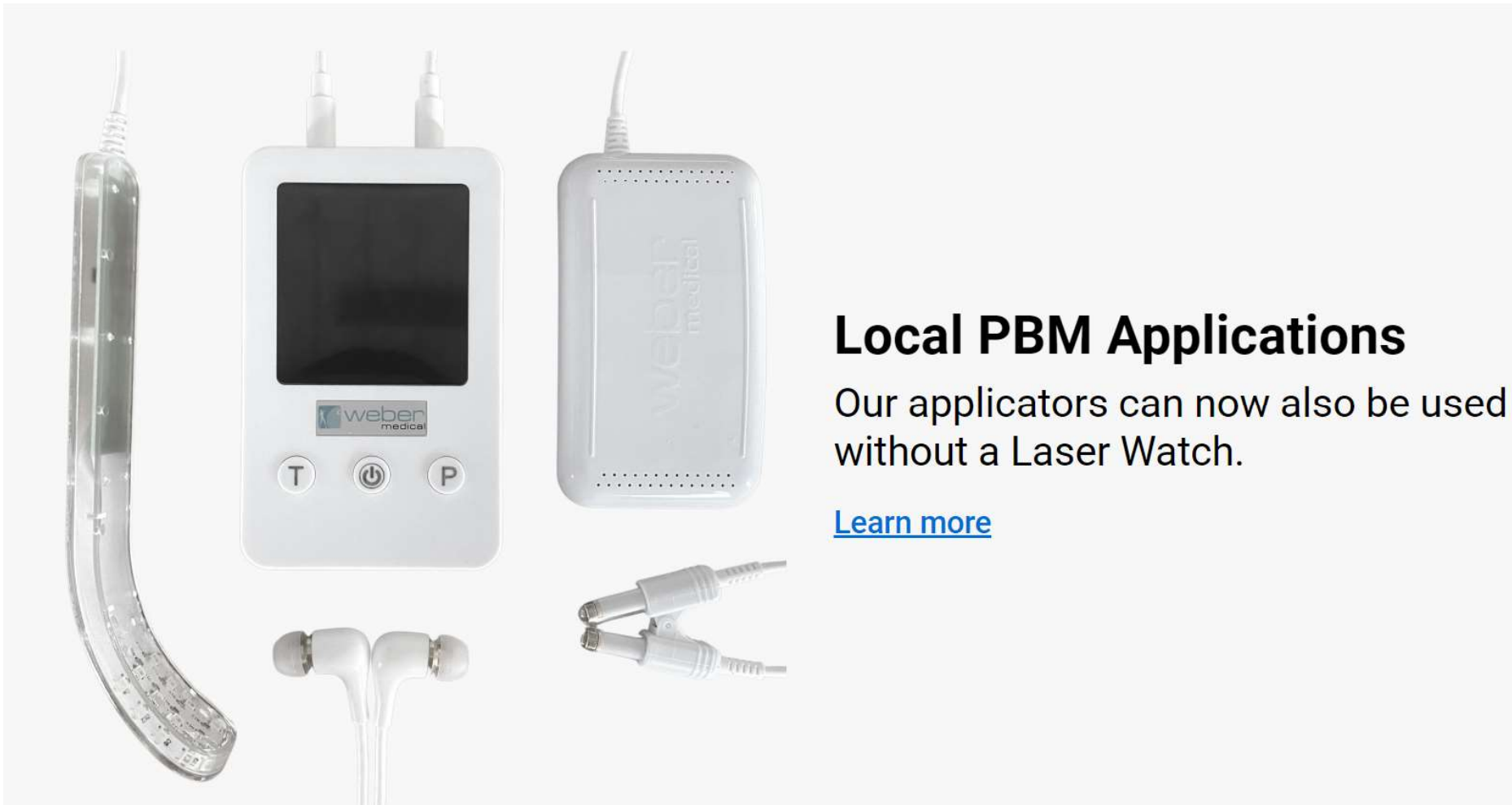
“I have been using the Endolight at home for 2 months, but also in the clinic, and I am really surprised and amazed at how effective the device is. Some patients who also had a red light Haemo-Laser therapy, estimate the effect of the Endolight even higher than the iv-red laser therapy.”

## EndoLight® Band Ongoing Research:



- Treatment of chronic inflammation
- Performance enhancement
- Pain management

# EndoLight® Band and Accessories:



## Local PBM Applications

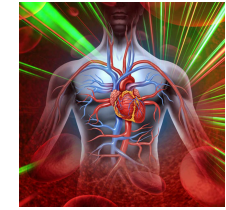
Our applicators can now also be used without a Laser Watch.

[Learn more](#)

# EndoLight® Band and Accessories:



# EndoLight® Band and Accessories:



## **Pain & Muscle Tension**

Red light has analgesic, spasmolytic and sedative effects [62, 63]. Yellow light alleviates (chronic) pain syndromes.

## **Skin**

Blue light acts anti-inflammatory by reducing pro-inflammatory cytokines and contributory factors for a variety of conditions (NF-kB, CRP, IL2, IL6, TNF alpha, Leptin, chemokines etc.) [51]. Red light improves oxygen delivery to tissue [62].



## **Hearing loss, Tinnitus**

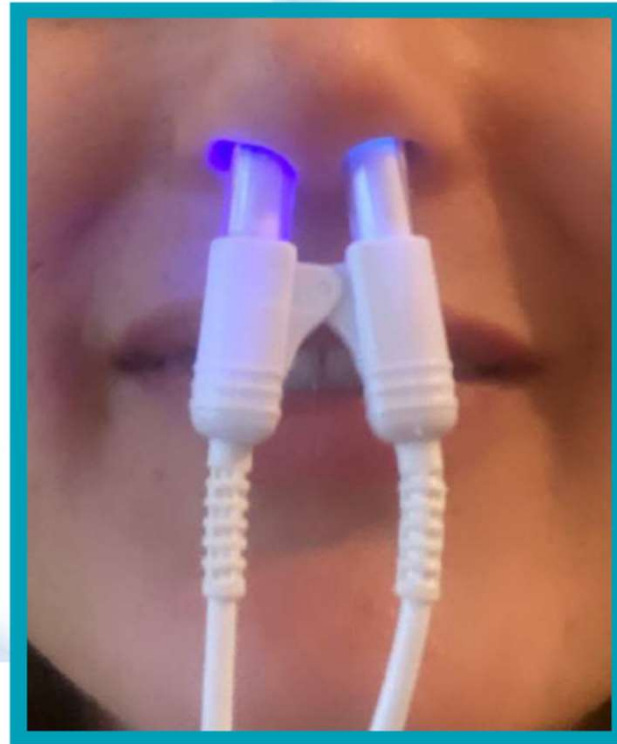
A lack of the vital cell energy ATP (adenosine triphosphate) can lead to tinnitus. An undersupply results in cell damage and subsequently in cell death. The laser boosts cell metabolism by enhancing ATP production and supports healing processes of degenerative diseases. It also improves microcirculation in tissues and accelerates cell growth [71].



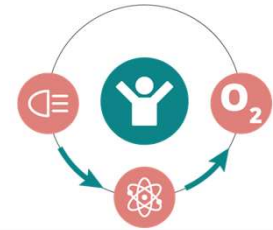
## **Intranasal blood irradiation, relief from rhinitis, sinusitis and allergic reactions**

In case of colds red light can support the decongestion of the nasal mucosa. Furthermore, red light inhibits histamine release and reduces the reaction of the immune system cells to allergens. Due to the many fine blood vessels inside the nose the intranasal application is ideal for external blood irradiation [72, 73].

# EndoLight® Band and Accessories:



# Photodynamic Effects



The laser watch can be combined with different light-sensitive supplements for achieving photodynamic effects, i.e. for additive cancer therapy, pathogen deactivation or prevention against cancer and infections.

Light-sensitive substances: **Chlorophyllin**, **Curcumin (Turmeric)**, **Hypericin (St. John's Wort)**, **Phycocyanin**

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



# New (oral) photosensitizer formulations



# BIOSOMO CURCUMIN



**CURCUMIN**, derived from Curcuma longa [also known as turmeric], is a golden colored spice widely used in the Indian subcontinent for healthcare and vitality. With long-standing use as part of Ayurvedic medicine since 1900 BC, Curcuma longa was used with many therapies to help alleviate and heal various diseases. Extensive research in recent years has shown anti-inflammatory, antioxidant, anti-viral, anti-bacterial and even anti-cancer properties. Curcumin is therefore a mighty tool that can impact many disease states.

- Liposomal encapsulated – highest bioavailability
- High quality and purity of all ingredients
- Curcumin extract with over 95% pure curcuminoids
- No chemical stabilizers or additional preservatives
- Developed by scientists in Germany



# BIOSOMO GREEN TEA



Natural products of Camellia sinensis, commonly known as **GREEN TEA**, has its origin 5000 years ago in China. With increasing tea consumption in western countries, a great surge of interest in the health benefits has emerged. Green tea health benefits include therapeutic support for various types of cancer, inflammation, cardiovascular diseases, and liver disease. These beneficial effects are related to its catechin profile and in particular epigallocatechin-3-gallate [EGCG].

- Liposomal encapsulated – highest bioavailability
- High quality and purity of all ingredients
- Green tea extract with at least 40% EGCG
- No chemical stabilizers or additional preservatives
- Developed by scientists in Germany



# BIOSOMO ALPHALIPON



**$\alpha$ -LIPOIC ACID (ALA)**, is an organosulfur compound, discovered by biochemist Esmond Emerson Snell in 1937. It is found in human mitochondria and plays a critical role for essential enzymatic functions. Since the 1970s, numerous studies showed valuable physiological properties and therapeutic effects. ALA is able to prevent diabetic polyneuropathies, to bind heavy metals and to scavenge free radicals out of our system.

- Liposomal encapsulated – highest bioavailability
- High quality and purity of all ingredients
- Liposomal encapsulated, secured from degradation (gastric acid)
- No chemical stabilizers or additional preservatives
- Developed by scientists in Germany



# BIOSOMO BOSWELLIA



**BOSWELLIA SERRATA** or Frankincense is a plant primarily known for its use during religious ceremonies. It has since been relatively forgotten until the 20<sup>th</sup> century where it reemerged as a medicine prescribed by both herbalists and physicians. During the early 1990s, the first studies appeared demonstrating its anti-inflammatory effect on chronic inflammatory diseases. Several recent studies also demonstrated its utility as an anti-cancer adjuvant therapy.



- Liposomal encapsulated – highest bioavailability
- High quality and purity of all ingredients
- High content of AKBA [Acetyl-11-Keto-β-Boswellic Acid]
- No chemical stabilizers or additional preservatives
- Developed by scientists in Germany

# Thank you!



GET INVOLVED

*How to get involved?*

- Become a research partner!
  - Become an affiliate!

Questions:

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