



N a n o S t a r ® f a m i l y

State-of-the-art Q-Switch lasers

The NanoStar® family give excellent results when removing tattoos, benign pigmented lesions and permanent make-up. The combination of multiple laser technologies enables treatments that are fast, effective, virtually painless, typically bloodless and leave no scars.





RubyStar

Laser: Ruby
Wavelength: 694 nm

1998

2002

RubyStar+

Laser: Ruby
Wavelength: 694 nm



TattooStar R

Laser: Ruby
Wavelength: 694 nm

2005

2006

TattooStar Y

Laser: Nd:YAG
Wavelength: 1064/532 nm



TattooStar Effect

Laser: Ruby/ Nd:YAG
Wavelength: 694/532/1064 nm

2008

2019

PicoStar

Laser: Nd:YAG
Wavelength: 1064/532 nm



NanoStar

Laser: Ruby/ Nd:YAG
Wavelength: 694/532/1064 nm

2021



Laser

Ruby, class 4
Nd:YAG, class 4



Wavelength

694 nm (Ruby)
532, 1064 nm (Nd:YAG)



Energy

Max. 1.2 J (Ruby QS)
Max. 1.5 J (Nd:YAG OP)



Max. fluence

694 nm (QS): 30 J/cm²
694 nm (PT): 50 J/cm²
532 nm (QS): 12.5 J/cm²
532 nm (OP): 15 J/cm²
1064 nm (QS): 25 J/cm²
1064 nm (OP): 37.5 J/cm²
1064 nm (PT): 50 J/cm²
MIX QS 694 + 1064 nm: 20 J/cm² + 17.5 J/cm²
MIX QS 694 + 532 nm: 20 J/cm² + 8.5 J/cm²
MIX PT 694 + 1064 nm: 32.5 J/cm² + 32.5 J/cm²



Pulse duration

30 ns (Ruby QS); 6 ns (Nd:YAG QS)
6 ns + 6 ns (Nd:YAG OP)
2 ms (694 PT); 300 μs (1064 PT)
MIX QS 694 + 1064 nm: 30 ns + 6 ns
MIX QS 694 + 532 nm: 30 ns + 6 ns
MIX PT 694 + 1064 nm: 1.6 ms + 300 μs



Frequency

Max. 3 Hz (Ruby)
Max. 10 Hz (Nd:YAG)



Size, weight

53 x 108 x 110 cm³ (B x T x H)
approx. 150 kg



Spot size

2x2, 3x3, 4x4, 5x5 mm²
8 mm Ø fractional DF
9 mm Ø fractional HC

QS = Q-Switched
OP = Opti-Pulse
PT = Photo-Thermal
DF = Deep Fractional
HC = High Coverage

EXPERIENCE

1998: Asclepion introduce their first Q-Switch laser for tattoo removal



The TattooStar R and TattooStar Y Q-Switch Lasers were a total success for Asclepion and greatly appreciated by their users.



With over 300 systems in Germany alone, the Q-Switch laser is one of Asclepion's most successful lasers on the market.



Over 20 years' experience



FEATURES



High energy & speed



OPTIBEAM II and MIXED technology



Automatic spot-size detection



Numerous hand pieces available for selection



Fractional handpieces available



Plug and Play technology

Q-Switched technology

Q-Switched lasers concentrate energy into a very short pulse (ns range).

Compared to a long-pulsed laser (ms range), extremely high peak power is reached using the same amount of energy.



	Pulse energy (J)	Pulse length (ms/ns)	Pulse power (W)	Spot size (mm)	Power density	
Long-pulse	60	40 ms	1.5 kW	12	1.3 kW/cm ²	1.3 x 10 ³ W/cm ²
Q-Switched	1	6 ns	166 MW	3	2,360 MW/cm ²	2.4 x 10 ⁹ W/cm ²

OptiPulse technology

OptiPulse (OP) technology allows the user to evenly distribute the selected fluence across two impulses of 6 ns each (double pulse) when using 532 and 1064 nm wavelengths. A pre-set rest period of 150 μ s between the pulses ensures a more gentle treatment for some applications (e.g. melasma).

Advantages:

- Reduction in purpura visible after treatment
- Less erythema formation in the skin
- Lower risk of post-inflammatory hyperpigmentation

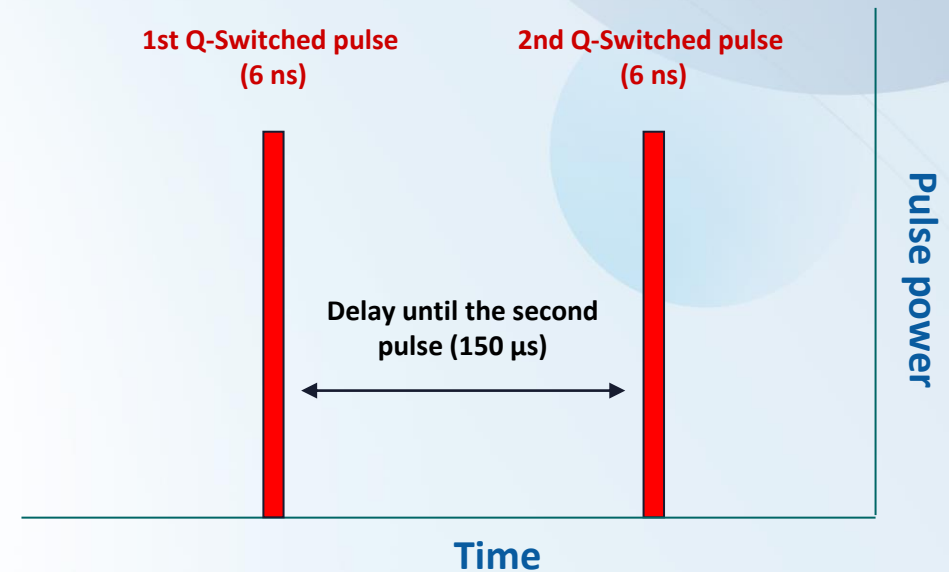
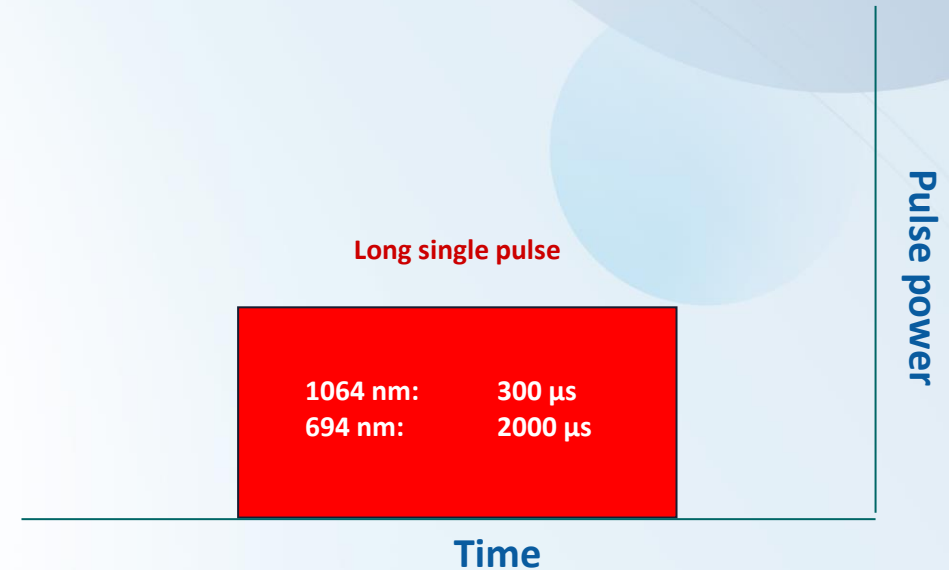


Photo Thermal Technology

The **Photo Thermal (PT)** mode is a type of “free-running” mode for the 1064 and 694 nm wavelengths. This mode can be used for all applications where heating of the target structure is desired, e.g. acne scars, rosacea, nail fungus, skin rejuvenation. This mode is often used as a supplementary treatment, e.g. in combination with fractional treatment.

Important:

The pulse length in Photo Thermal mode depends on the selected wavelength. When using 1064 nm a 300 μ s impulse is emitted and at 694 nm a 2 ms impulse.



OPTIBEAM II technology

Thanks to the use of our modern **OPTIBEAM II** technology, the handpieces generate a perfect **FLAT-TOP** beam profile without hotspots, ensuring the laser output is distributed **evenly** across the entire spot. The square and homogeneous spot guarantees the best possible treatment:

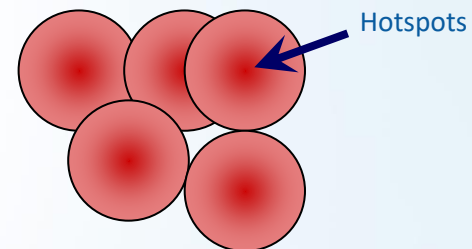
- ▶ Prevents areas being missed out or treated more than once
- ▶ Simpler and more precise positioning of each shot
- ▶ 20% shorter treatment time compared to traditional spot pulses

OPTIBEAM II laser spot with homogeneous FLAT-TOP beam profile



simple, correct positioning and homogeneous energy distribution

Normal laser spot with Gaussian beam profile

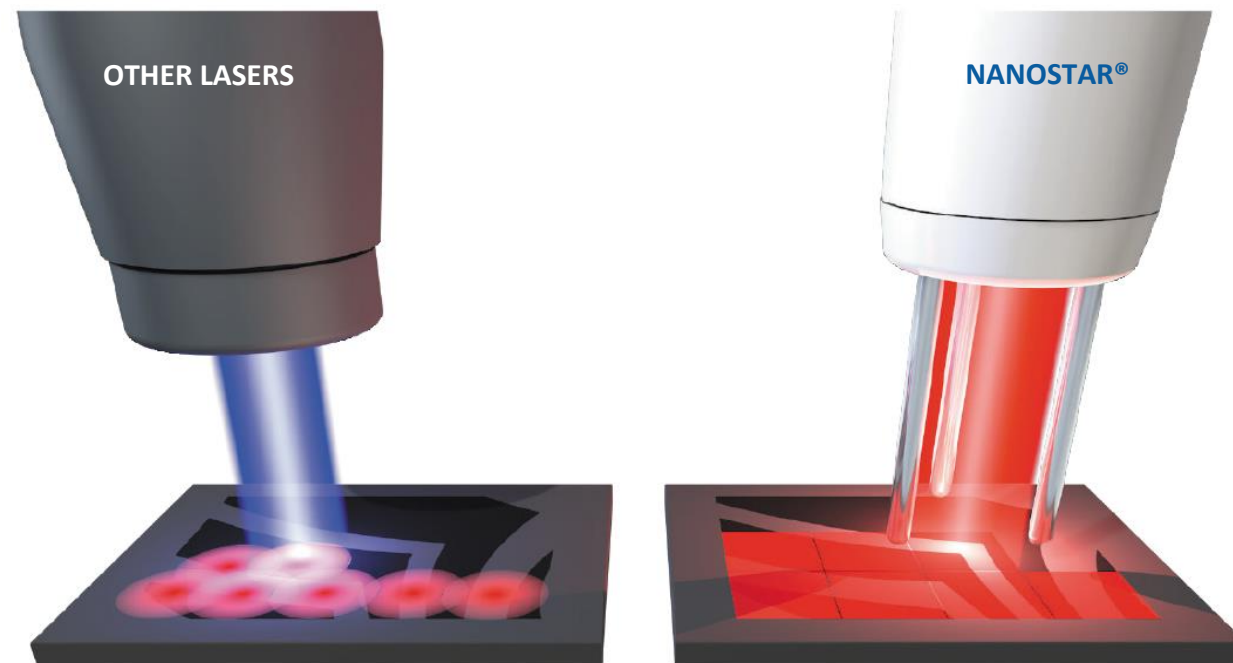


difficult to position and non-homogeneous energy distribution

OPTIBEAM II technology

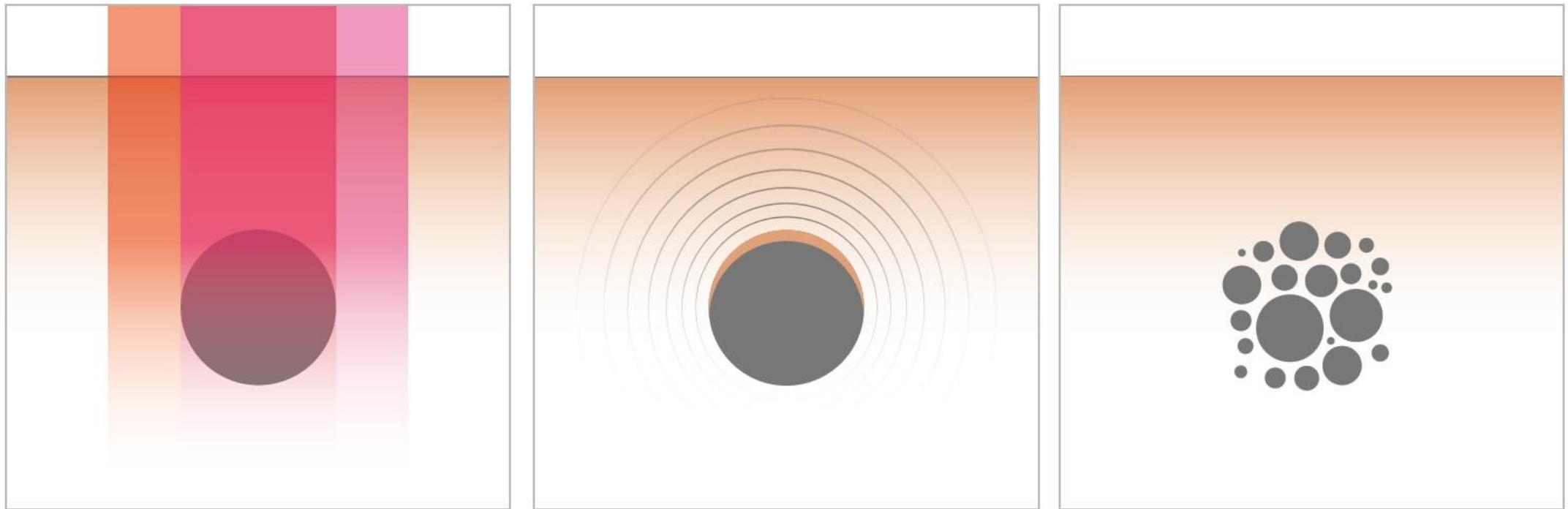
The various handpieces with OPTIBEAM II technology ensure optimal treatment.

The beam profile is slightly divergent for safer and more efficient treatment.



MIXED technology*

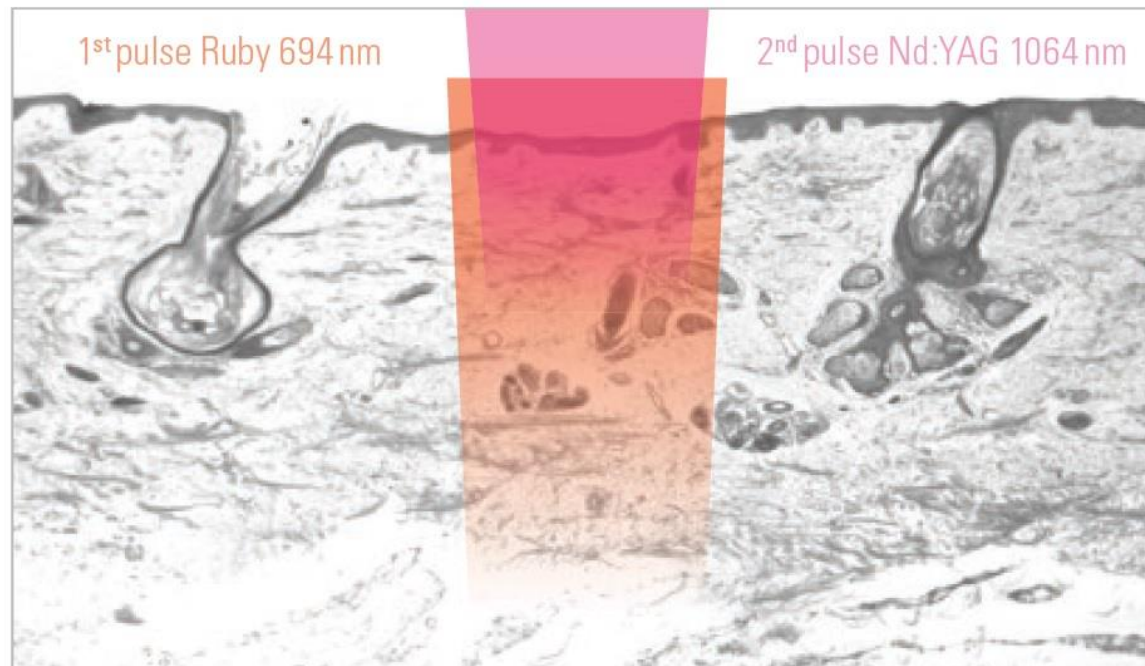
NanoStar® C MT is capable of simultaneous energy delivery from different Q-Switched laser sources (Ruby and Nd:YAG) and gives superior results when dealing with resistant colours like dark blue and black.



* The Mixed technology is only available with the NanoStar® C MT.

MIXED technology | 694 + 1064 nm

For pigment treatment, the Nd:YAG 1064 nm laser pulse offers maximum safety due to the reduced absorption within melanin and a higher depth of penetration.



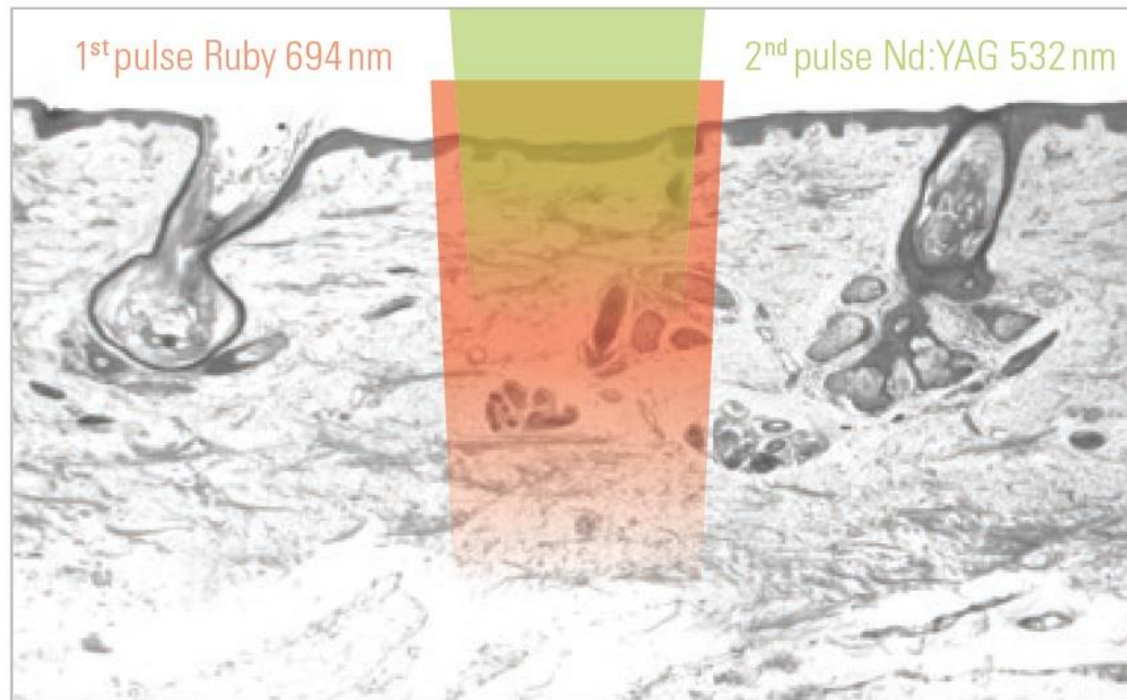
Melasma can be treated more effectively with the additional use of the Ruby 694 nm wavelength which has a lower depth of penetration and higher absorption in melanin.

The NanoStar® C MT is therefore the ideal tool for this kind of treatment and delivers high efficacy whilst ensuring maximum safety for the patient.

MIXED technology | 694 + 532 nm

The combination of Nd:YAG 532 nm and Ruby 694 nm offers major advantages when it comes to treating pigmentation.

Melanin absorbs 532 nm very well whilst the 694 nm wavelength is strongly absorbed by melanin and minimally by blood.



With the NanoStar® C MT, thanks to the sequential emission or combined emission of both wavelengths, targeted melanin absorption can be combined with a reduction in the risk of the formation of purpura thereby ensuring maximum efficacy and safety.

Plug & Play handpieces



The handpieces for the NanoStar® family are easy to change and have a click-lock closure. The front section of the handpiece is colour-coded for easy visual recognition and the spot size is automatically detected and set when the handpiece is connected to the system .

Large selection of handpieces



2 x 2 mm²
(Purple)



3 x 3 mm²
(Red)



4 x 4 mm²
(Yellow)



5 x 5 mm²
(Green)

A large selection of handpieces is available in the NanoStar® family. The colour-coding makes your everyday work easier and the spacers can be sterilised at any time.

Fractional handpieces



Handpiece DF
(8 mm Ø, black)



Handpiece HC
(9 mm Ø, grey)

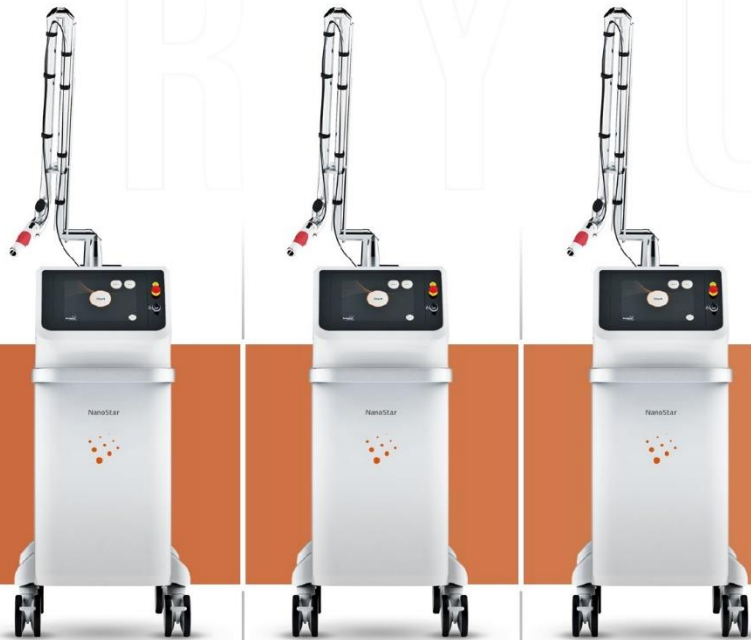
Fractional handpieces for the NanoStar® use a **modern micro lens array** to achieve a **homogenous spot regardless of fluence**. The technology expands the NanoStar's® spectrum of applications. DF stands for “Deep Fractional” and is particularly suitable for skin rejuvenation and scar treatment. HC stands for “High Coverage” and is particularly suitable for treating light-induced signs of aging and pigmentation. It has a more gentle effect on the skin than the DF handpiece.

Fractional handpieces – technical data

	8 mm DF (Deep Fractional)	9 mm HC (High Coverage)
	1064 nm	
Cover rate	5%	25%
Micro laser beam \emptyset	0.2 mm	0.54 mm
	532 nm	
Cover rate	3%	20%
Micro laser beam \emptyset	0.16 mm	0.47 mm
	694 nm, 532 nm + 694 nm, 1064 nm + 694 nm	
Cover rate	10%	40%
Micro laser beam \emptyset	0.27 mm	0.73 mm



Three versions for all requirements



NanoStar® R

NanoStar® Y

NanoStar® C

NanoStar® R	NanoStar® Y	NanoStar® C / NanoStar® C MT
Ruby (Q-Switched laser)	Nd:YAG (Q-Switched laser)	Ruby + Nd:YAG (Q-Switched laser)
694 nm	532, 1064 nm	532, 694, 1064 nm MIXED TECHNOLOGY (ONLY WITH NANOSTAR® C MT)
Tattoo removal Pigment removal	Tattoo removal Pigment removal Skin rejuvenation	Tattoo removal Pigment removal Skin rejuvenation

State-of-the-art design

Long articulated mirror arm for optimal flexibility

Large wheels for easy transport

Low reflection 10.4" HD widescreen LCD with touchscreen

Straight lines with rounded corners for a modern appearance



Modern user interface

high-resolution 10.4" widescreen display

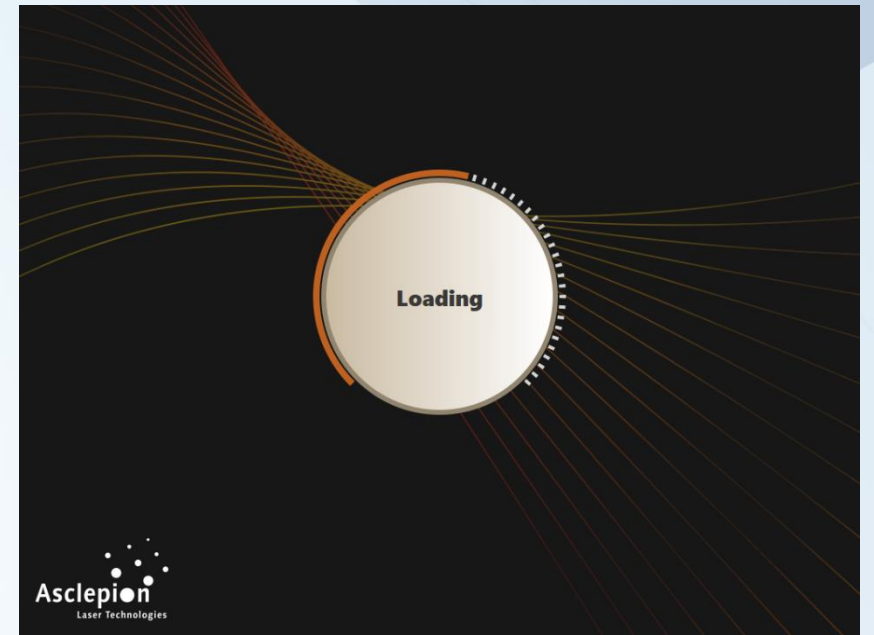
Dark background for stronger contrast and even more brilliant colours

Accentuation of active elements with changes in colour and size

Large buttons and fonts for easy identification and operation

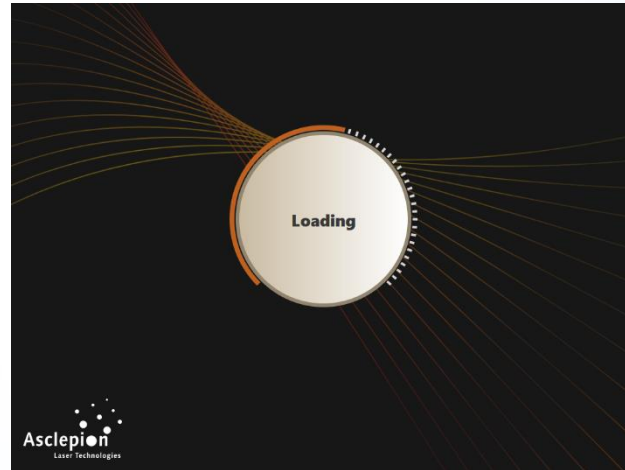
Intuitive user guidance through a step-by-step selection screen

Clean lines and rounded corners – similar to the device design itself

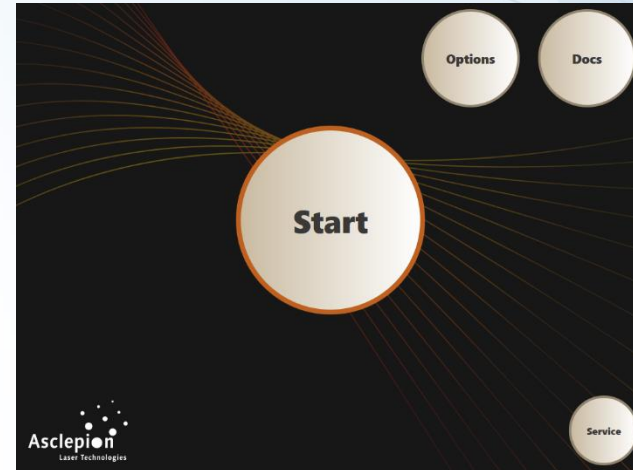


Intuitive operation

Boot



Start

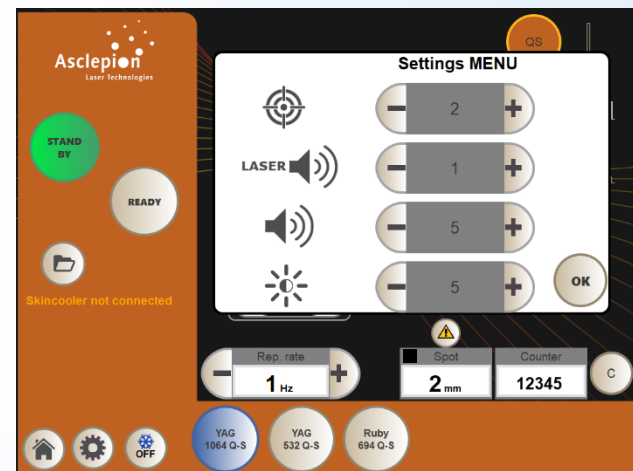


Laser



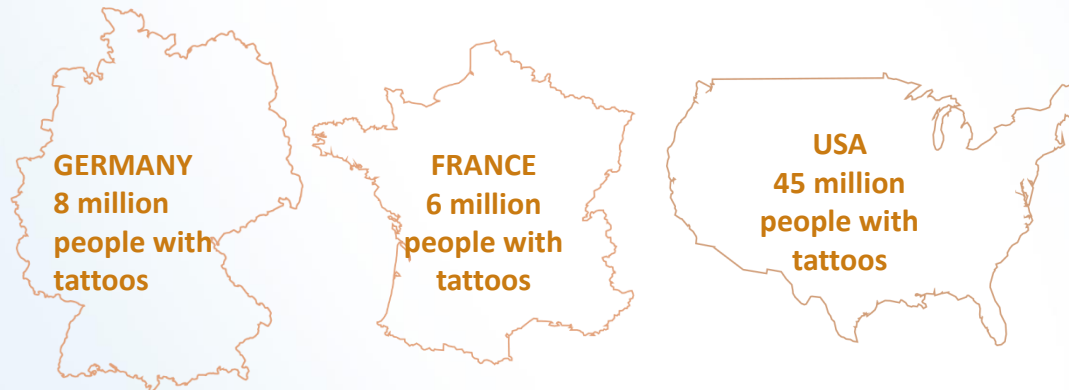
Start

Settings



Market | Tattoo removal

Around 10% of all those with tattoos want to have their tattoo removed again and there are millions in this market segment*...



Ø €200 per laser treatment
15 minutes for each of seven
laser treatments

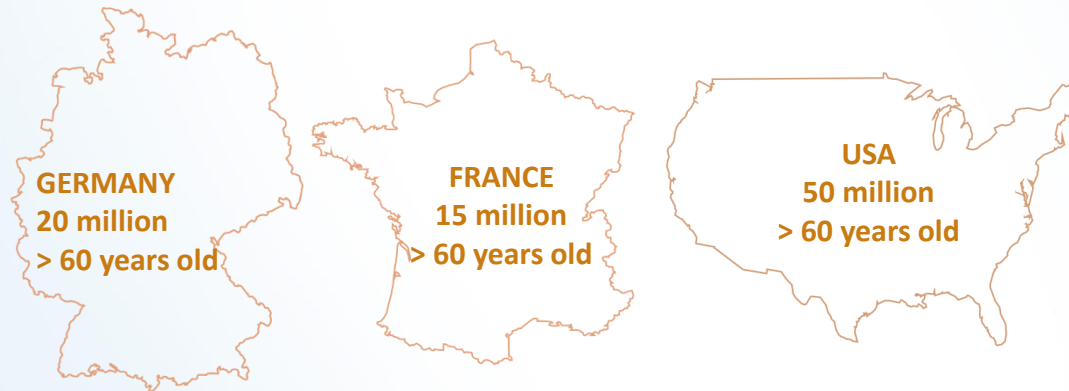
€800 TURNOVER / HOUR

€1,400 TURNOVER / PATIENT



Market | Pigment removal

From the age of 60, almost 90% of all light-skinned people develop lentigenes, which means millions are affected*...



Ø €100 per laser treatment
5 minutes per laser treatment

€1,200 TURNOVER / HOUR
€100 TURNOVER / PATIENT



Selective absorption

694 nm

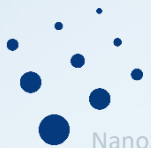
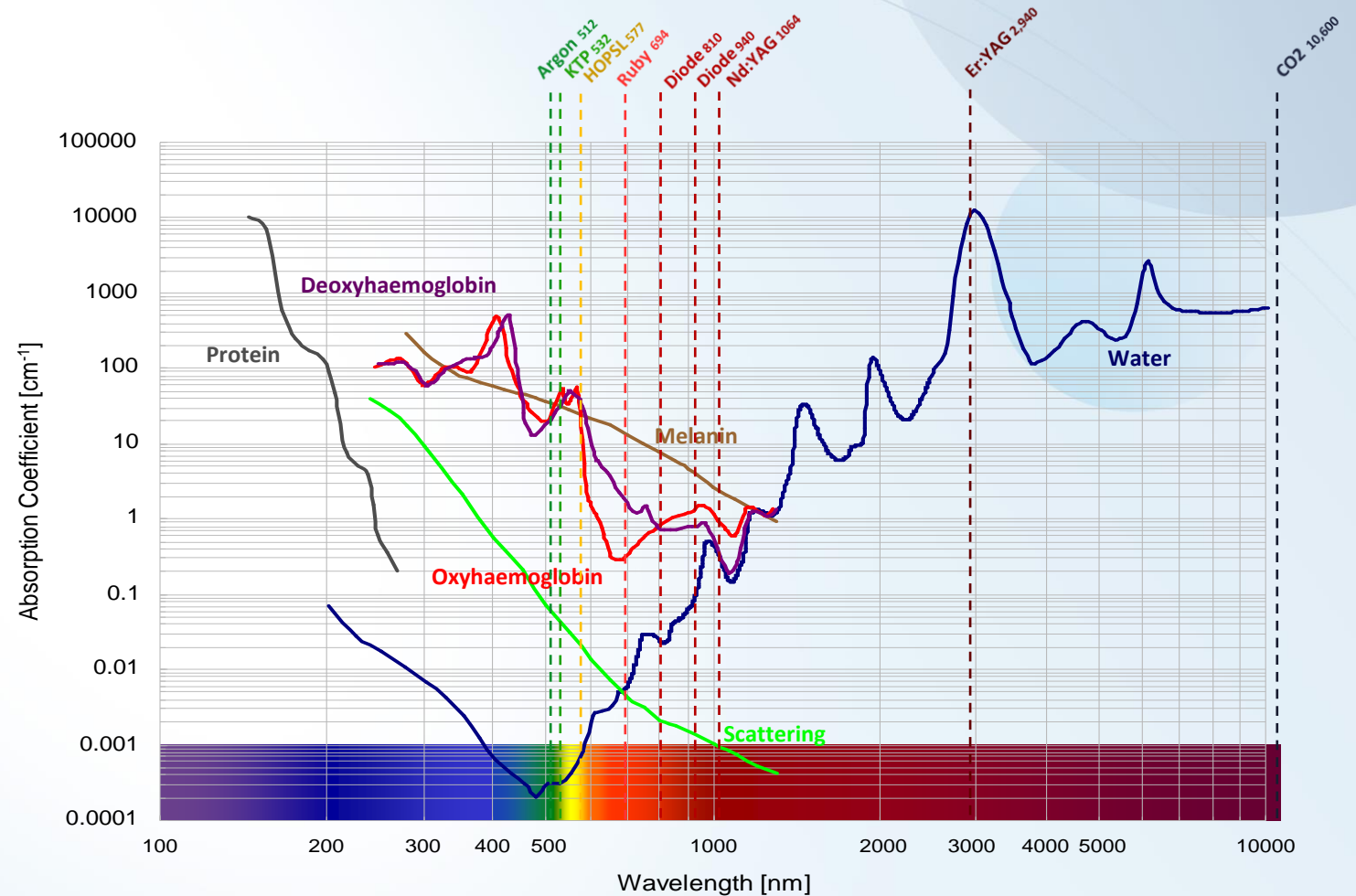
LOW ABSORPTION
in melanin and water.
Side effects in blood vessels and other tissues are low.

532 nm

HIGH ABSORPTION
in melanin.
Pigments are fragmented and reabsorbed by the lymphatic system.

1064 nm

LOW ABSORPTION
in melanin.
Gentle, particularly on darker skin types.




Indication overview

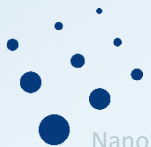
532 nm

1064 nm

694 nm

fractional

Technology	Nd:YAG	Nd:YAG	Ruby	Nd:YAG
Benign pigmented lesions	✓	✓	✓	✓
Tattoos and permanent make-up				✗
Traumatic tattoos	✗	✓	✓	✗
Toning	✗	✓	✓	✗
Skin rejuvenation	✓	✓	✓	✓
Scar treatment	✗	✗	✗	✓



LASERS IN MEDICINE AND AESTHETICS

The **NanoStar®** family are some of the latest Q-Switched lasers available in the aesthetic medicine market for the removal of tattoos and benign pigmentation. This tried-and-tested technology offers numerous features, is highly reliable, easy to use and produces good results.





NANO LASER

Nanosecond lasers are used for the removal of tattoos, unsightly pigmentation and skin rejuvenation.

The key feature of these lasers is the ultra-short pulses they produce in different wavelengths, which enable safe, precise and relatively painless treatments.



Tattoo removal

Laser therapy is the most widely accepted, effective, non-invasive treatment method.

precise, fast
and painless

no scarring

no time-off

no anaesthetic
required

no preparation
of the skin
required

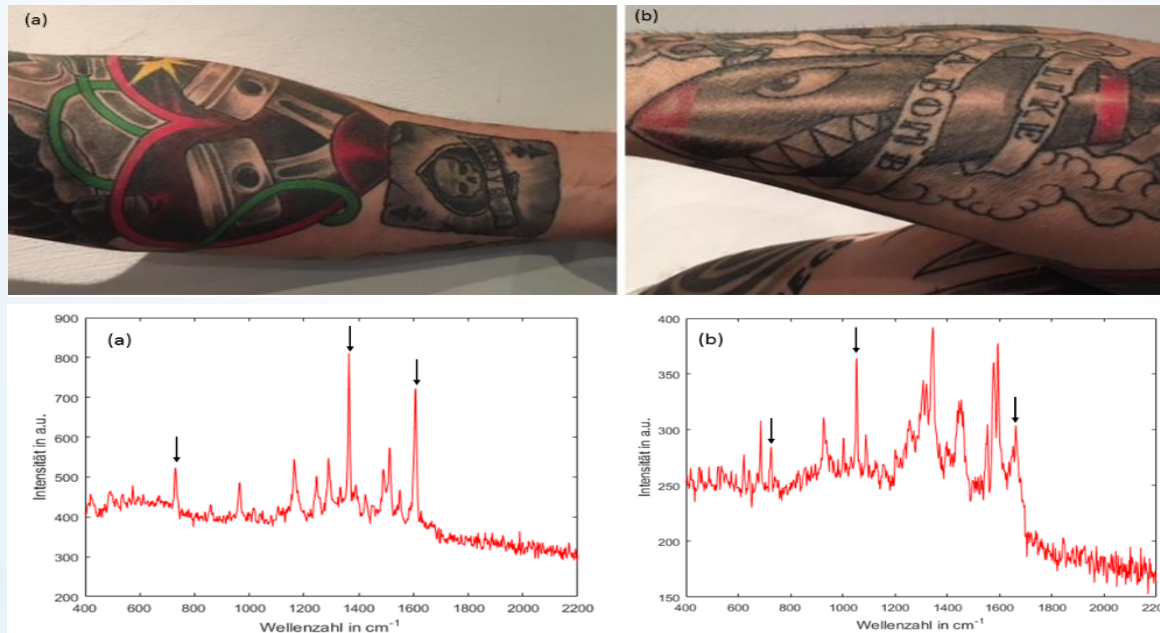


Tattoo removal | Pigment typology

Tattoo types	Pigment type	Pigment concentration	Pigment depth
Professional	Organometallic dye	Dense	Deep
Amateur	Ink (carbon)	Low	Variable
Cosmetic	Iron or titanium oxide	Low	Superficial
Traumatic	Carbons, metals, Dirt	Variable	Variable
Medical	Ink (carbon)	Low	Superficial

Tattoo removal | Pigment typology

- Inorganic carbon (black), TiO₂ (white), CdS (yellow), cinnabar (red), ...
- Organic (synthetic azo compounds)
- Nanoparticles: size ranges from a few nm to several 100 nm
- Powder or emulsion
- Typically not pure, rather compounds
- Different in absorption, size, shape



Raman spectra of two similar red tattoo colors

Source: Charité Berlin, private communication

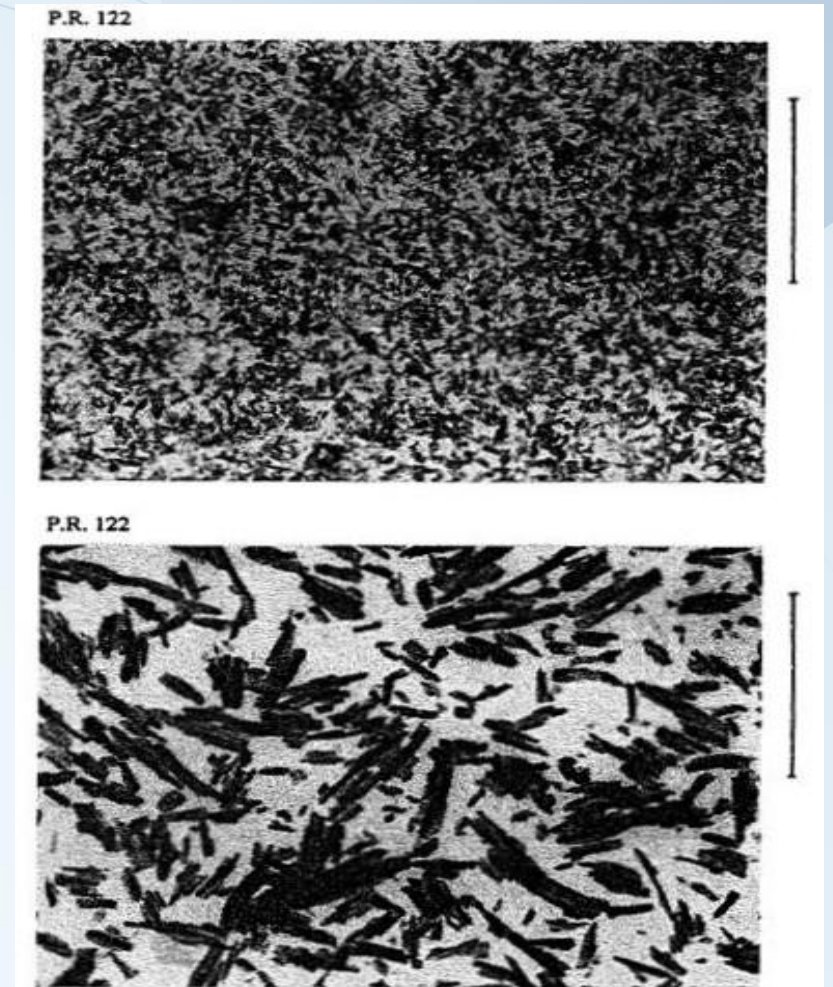
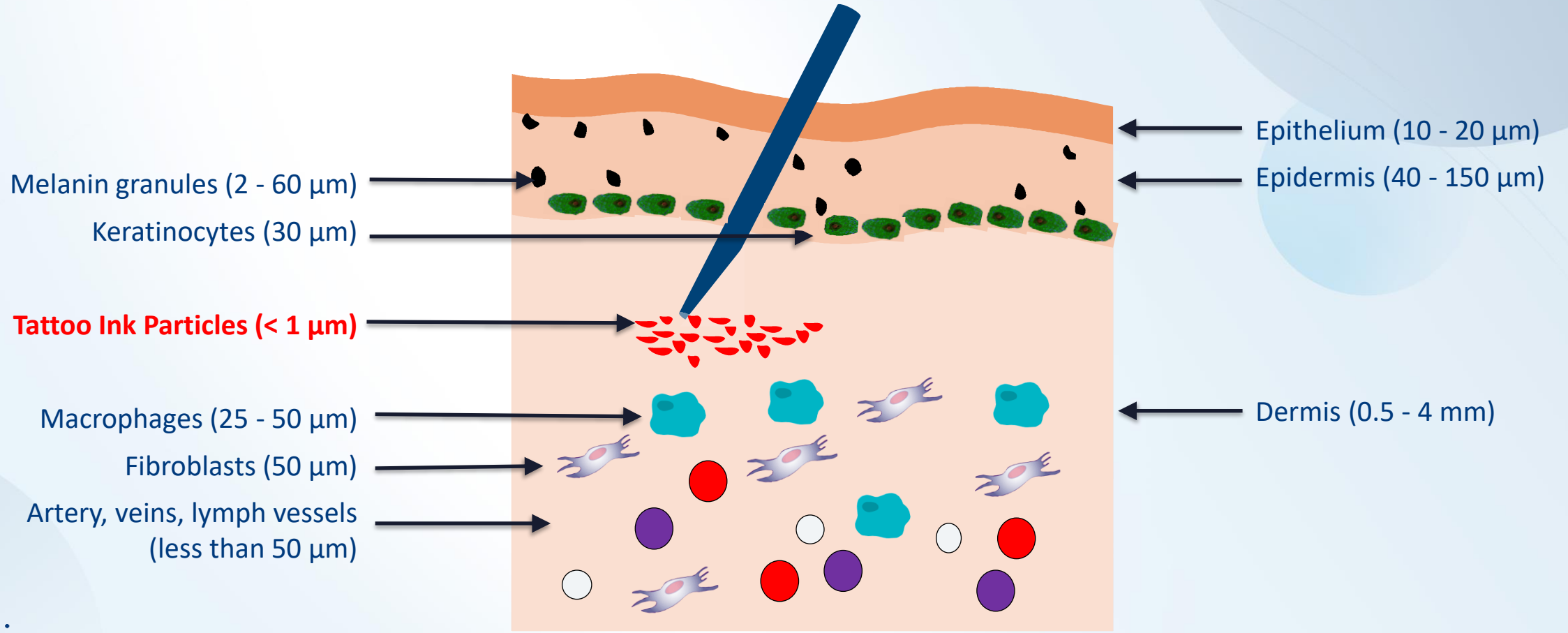


Fig. 3. Transmission electron microscopy images of two different shapes of the pigment P.R. 122. Scale bars = 1,000 nm.

Source: Bäumlner et al: q-switch laser and Tattoo pigments
Lasers in Surgery and Medicine 26, 13-21 (2000)

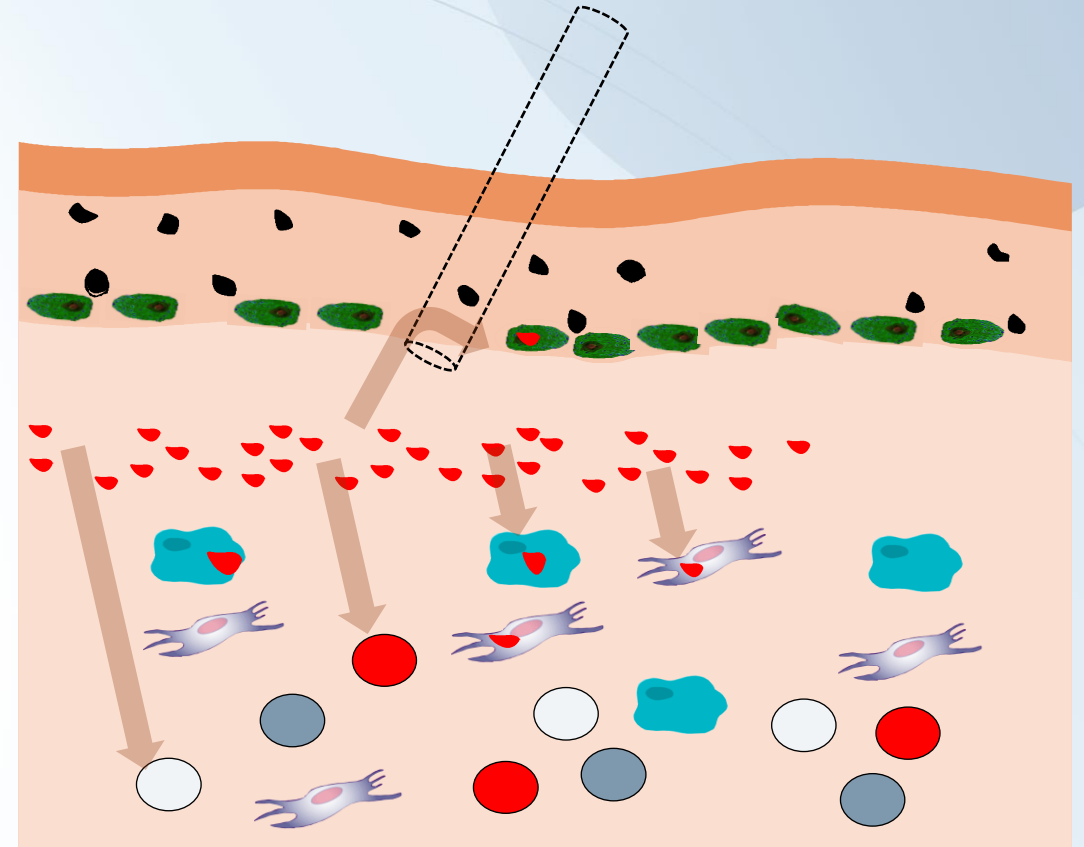
Tattoo removal | Pigment sizes



Tattoo removal | Biological Effects

Soon after tattoo injection of ink particles

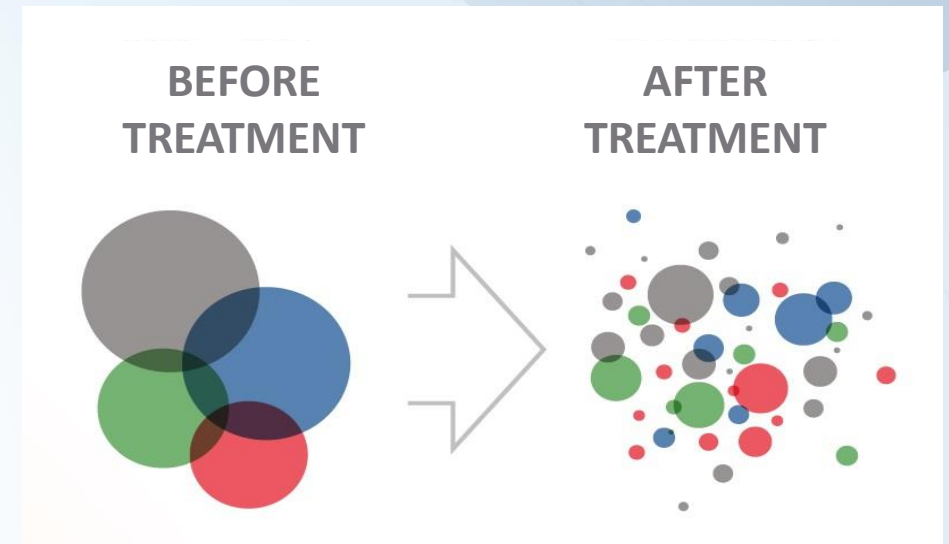
- Some fading by transdermal migration to the epidermis through dermo-epidermal wound channels → Phagocytosed by Keratinocytes.
- The majority of tattoo pigment can be found agglomerated in clumps within the macrophages and fibroblasts (intracytoplasmatically, few μm in size).
- Up to 30% of the injected tattoo pigment is rapidly cleansed by the body.
- Typically, less lymphatic migration is seen.



Tattoo removal | Biological Effects

Photo disruption by photoacoustic effect

- The tattoo ink particles absorb the radiation. Thermal effect (heating) is related to the ink particle's size.
- Ink particles, clusters and cells which contain pigment are mechanically fractured by the photoacoustic effect.
- Following exposure, steam (CO_2) produced in the dermis forms vacuoles seen as a whitening of the skin (Frosting/Whitening).
- Laser treatment increases transdermal migration through injury of the Basal membrane.
- The ink particles mobilize and migrate through the lymphatic system to the regional lymph nodes.
- Remaining dyes in dermis are mainly located within the macrophages or extracellularly.



Nanosecond pulses shatter the pigment into small particles, which are then small enough to be removed by the lymphatic system - **Phagocytosis**.

Tattoo removal | Biological Effects

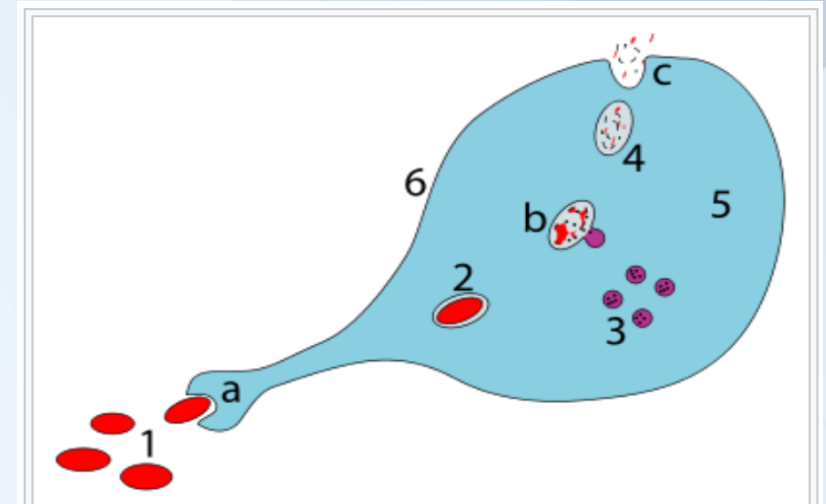
Phagocytosis: Capture of particles into a single cell by phagocytes

Some days after:

- Moderate inflammatory response
- Reaction of macrophages and leucocytes, each containing ink pigments
- Laser treatment enhances transdermal migration due to injury of the basal membrane (dermo-epidermal tunnels)

Some weeks after:

- Intracellular pigment localization (phagocytosed by the macrophages)
- Mixed types of reactive hyperplasia and intracellular pigments are seen in the lymph nodes



Steps of a macrophage ingesting a pathogen:

- a. Ingestion through phagocytosis, a phagosome is formed
- b. The fusion of lysosomes with the phagosome creates a **phagolysosome**; the pathogen is broken down by enzymes
- c. Waste material is expelled or **assimilated** (the latter not pictured)

Parts:

1. Pathogens
2. Phagosome
3. Lysosomes
4. Waste material
5. Cytoplasm
6. Cell membrane

Source: [wikipedia.org/wiki/Macrophage](https://en.wikipedia.org/wiki/Macrophage)

Tattoo removal | Biological Effects

Summary

- Ink particles are mostly seen within **phagocytes**, less often extracellularly.
- Ink particles are mostly present in the form of clusters (some μm in size), more rarely as nano-particles ($< 100 \text{ nm}$).
- Ink particles, clusters and cells containing pigment are fractured by the laser treatment through a photoacoustic effect \rightarrow easier to be removed by the body's.
- Dye injection and laser treatment increase temporary the transdermal migration by injury of the Basal membrane \rightarrow Fade-out effect
- The dye particles and phagocytes migrate through the lymphatics to the regional lymph nodes similar to melanoma cells.
- Following exposure, production of steam (CO_2) in the dermis forms vacuoles and causes the skin to whiten (Frosting/Whitening).

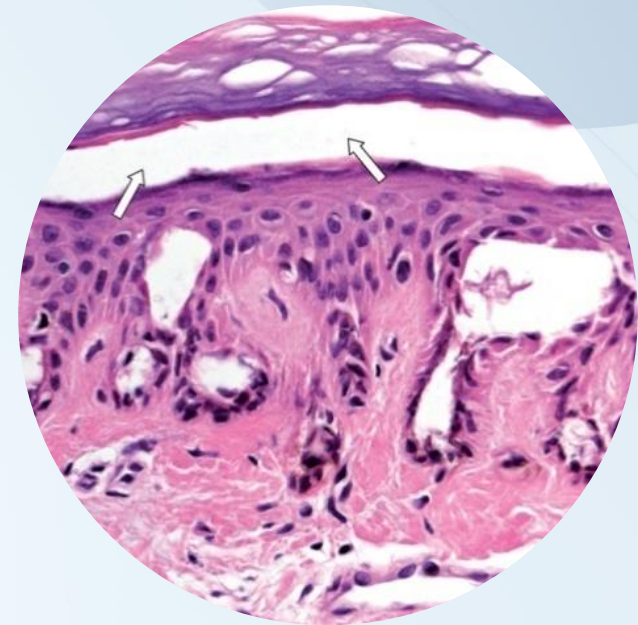
Tattoo removal | Clinical end point



before

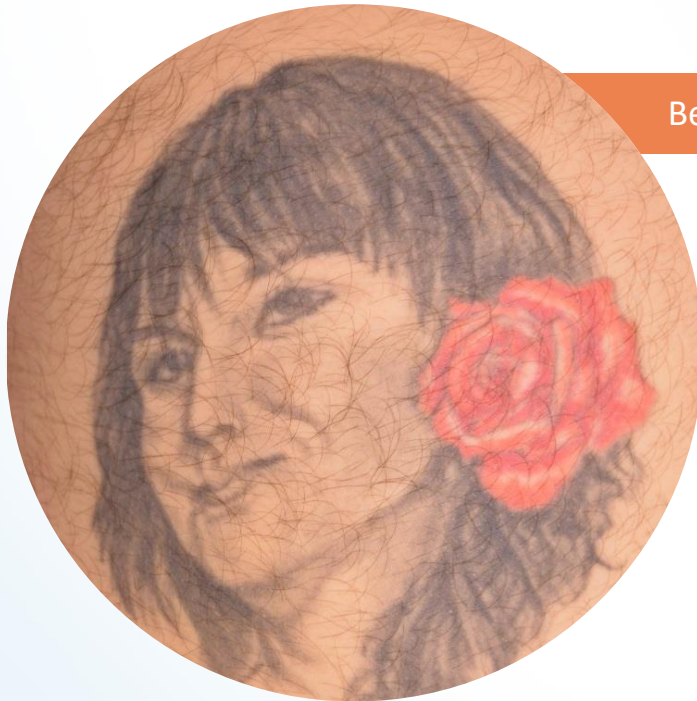


immediately after the treatment, whitish-grey skin change (whitening), caused by extremely rapid heating of the pigment and evaporation of the water in the tissue, formation of vacuoles

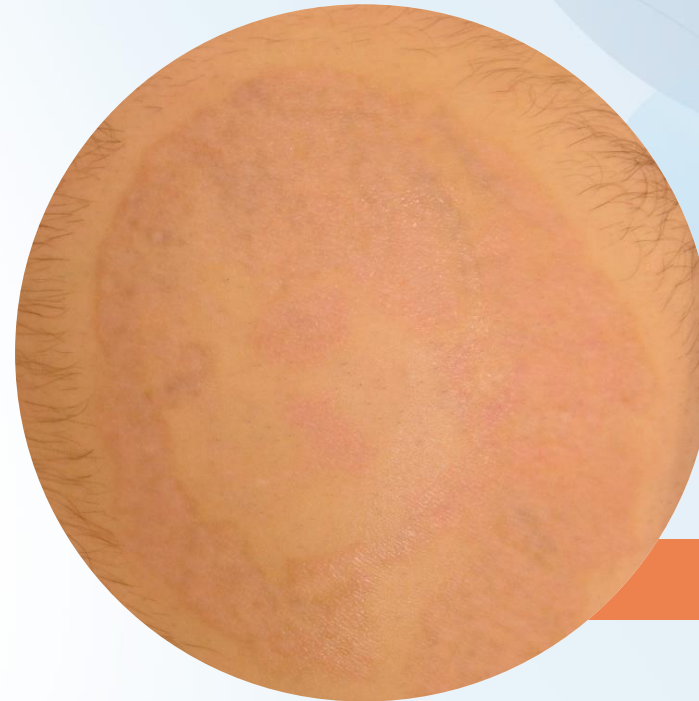


E. Richter et al:
In vivo analysis of solar Lentigines by reflectance confocal microscopy before and after Q-switched Ruby laser treatment
Acta Derm Venerol 2011; 91: 164–168

Tattoo removal | Results



Before



After

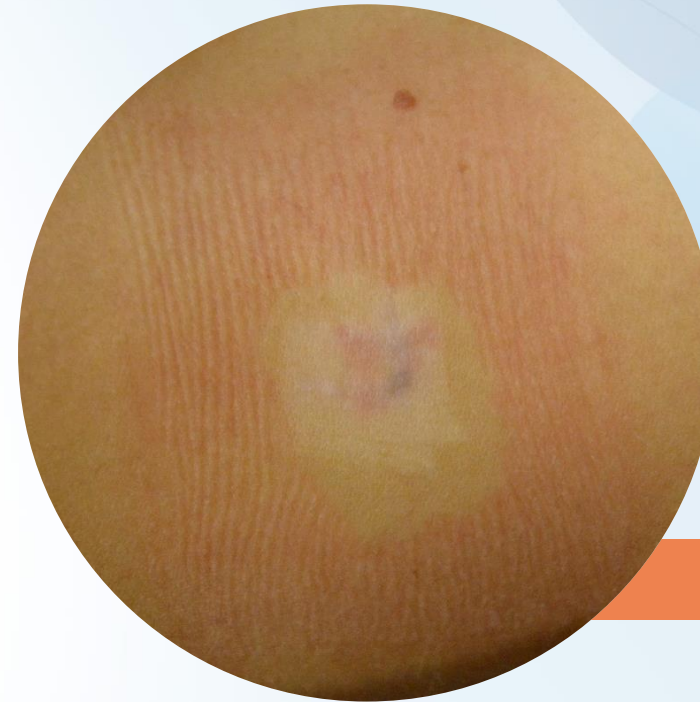
Arm: 1064 nm



Tattoo removal | Results



Before



After

Neck: 1064 nm



Tattoo removal | Results



Before

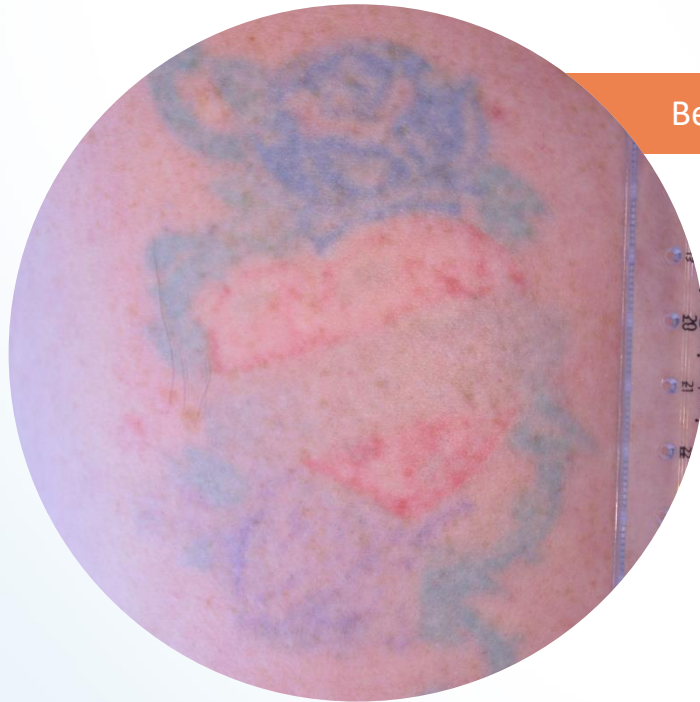


After

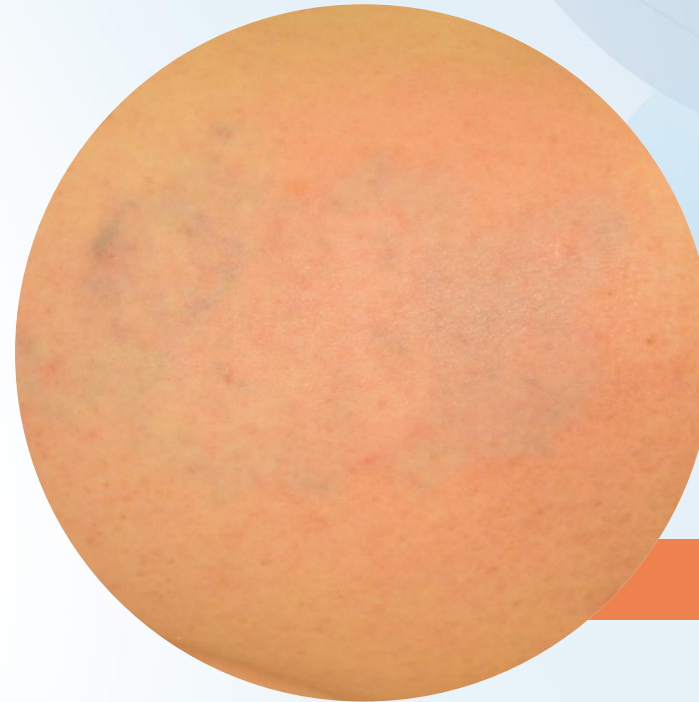
Back: 1064 nm



Tattoo removal | Results

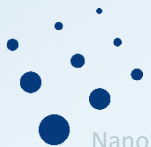


Before



After

Back: 1064 nm



Tattoo removal | Results



Before



After

Neck: 1064 nm



Tattoo removal | Results



Before



After

Arm: 1064 nm



Indications | Pigments

Laser therapy is the most widely accepted, effective, non-invasive treatment method.

simple and gentle procedure

fast and painless

no scarring

usually only takes one session

impressive results



Indications | Pigments

Before the treatment:

Clean the treatment area (remove hair, cosmetics, deodorant)

Clinical end point:

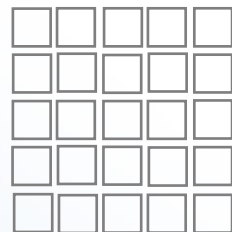
immediate reaction in the form of a whiteish-grey skin change (whitening), caused by extremely rapid heating of the pigment and evaporation of the water in the tissue, as well as formation of vacuoles

After the treatment:

Formation of scabs which heal as normal

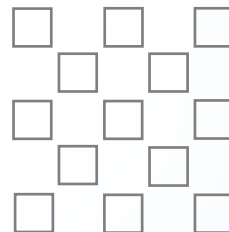
Treatment techniques:

for small areas

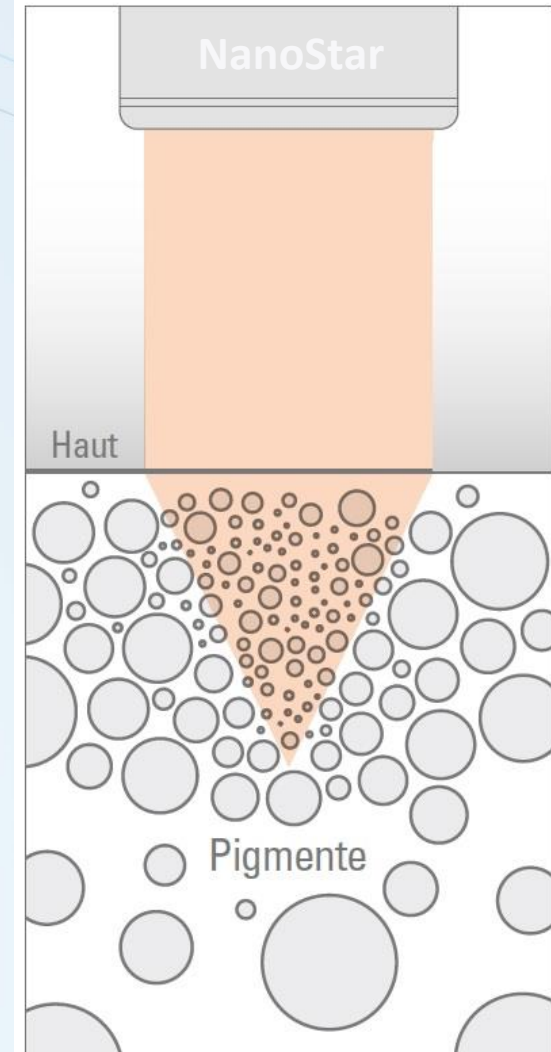


Point-by-point coverage

for large areas



Polka dot



Effective range of the laser radiation

Pigment removal | Results



before



immediately after the treatment,
the skin typically turns greyish-
white



after one treatment session



Pigment removal | Results



Before



After

Face: 532 nm



Pigment removal | Results



Before



After

Face: 532 nm



Pigment removal | Results



Before



After

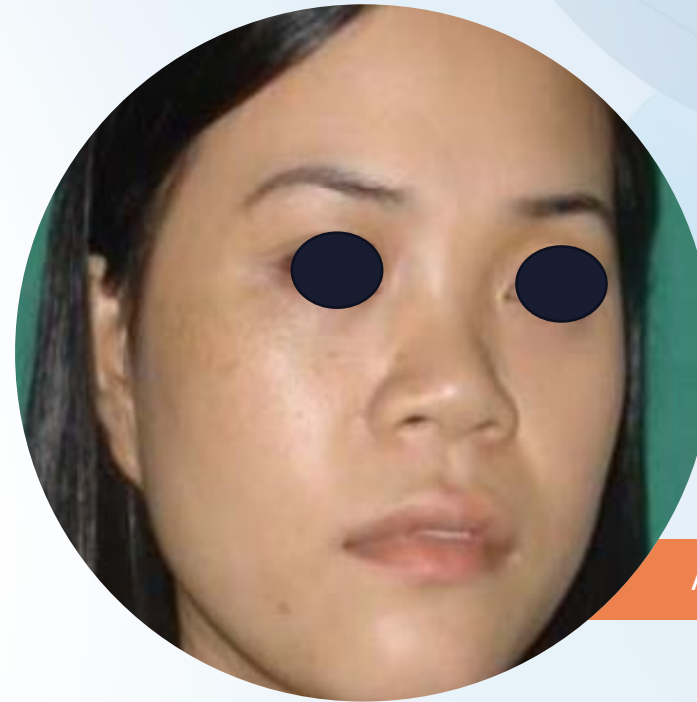
Face: 532 nm



Pigment removal | Results



Before



After 4 Tx

Cheek: 694 nm



Pigment removal | Results



Before



After 4 Tx

Cheek: 694 nm



Pigment removal | Results



Before



After 2 weeks



After 1 month

Cheek: Ruby laser, 1 treatment, 4 J/cm²



Pigment removal | Results



Before

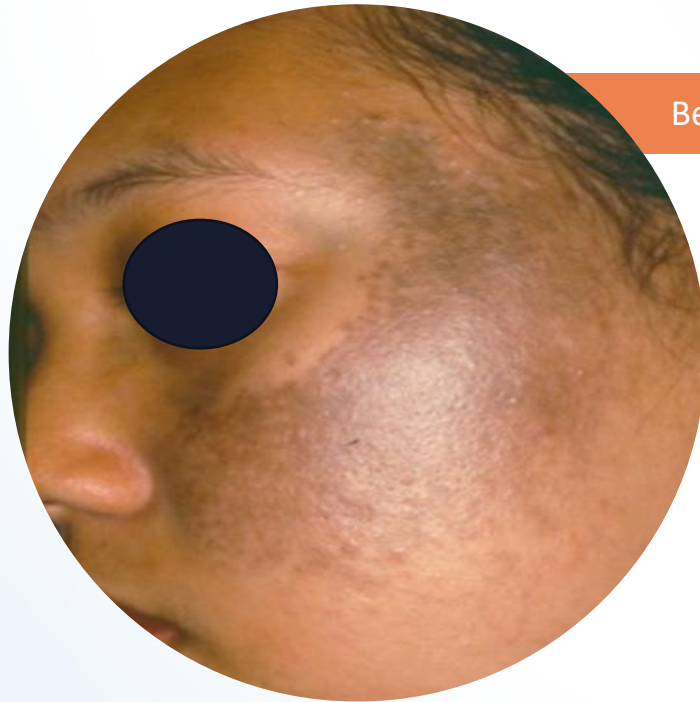


After

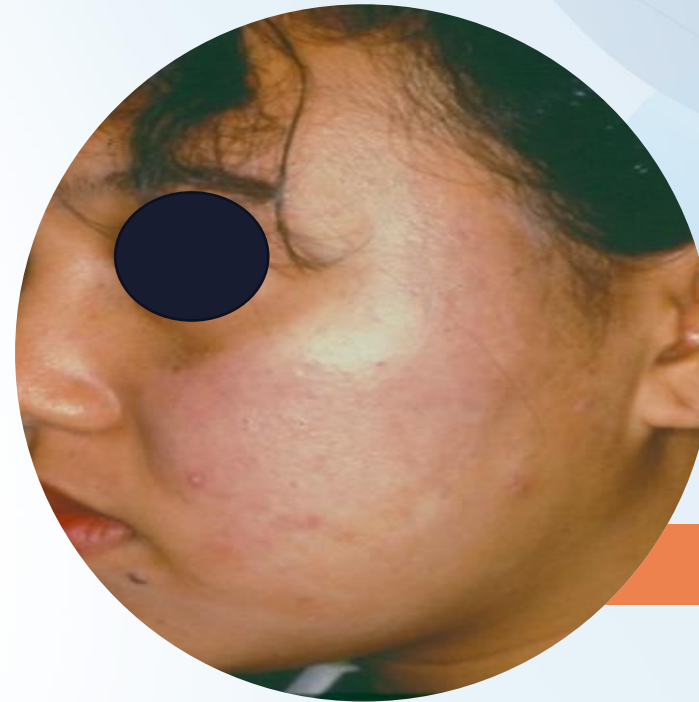
Freckles: Ruby laser, 1 treatment, 3 J/cm²



Pigment removal | Results



Before



After

Nevus Ota: Ruby laser, 7 treatments, 7-8 J/cm²



Pigment removal | Results



Before



After

Face: Ruby laser



Pigment removal | Results



Before



After 1
year

Face: Ruby laser, 3 treatments, 6-6.5 J/cm²



Pigment removal | Results



Before

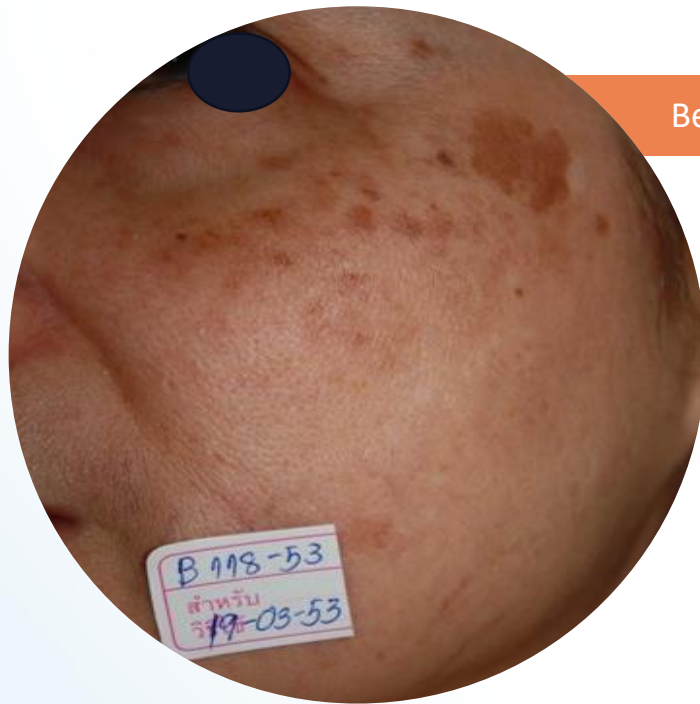


After

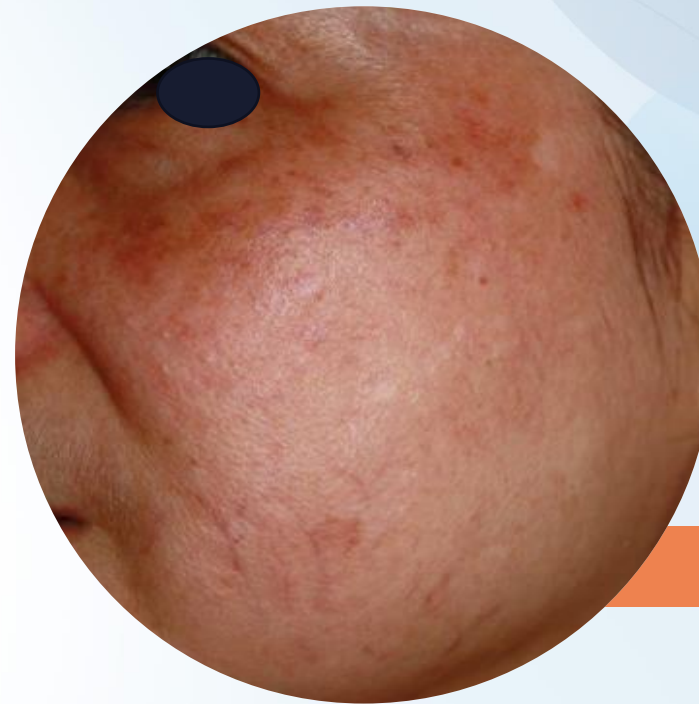
Periorbital darkening: Ruby laser



Pigment removal | Results



Before



After 1
month

Face: Ruby Laser



Pigment removal | Results

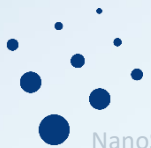


Before

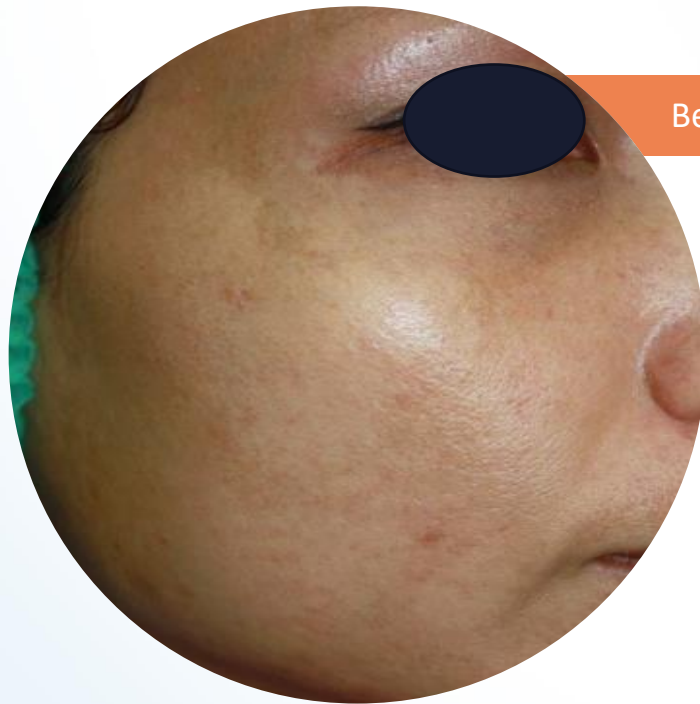


After 1
month

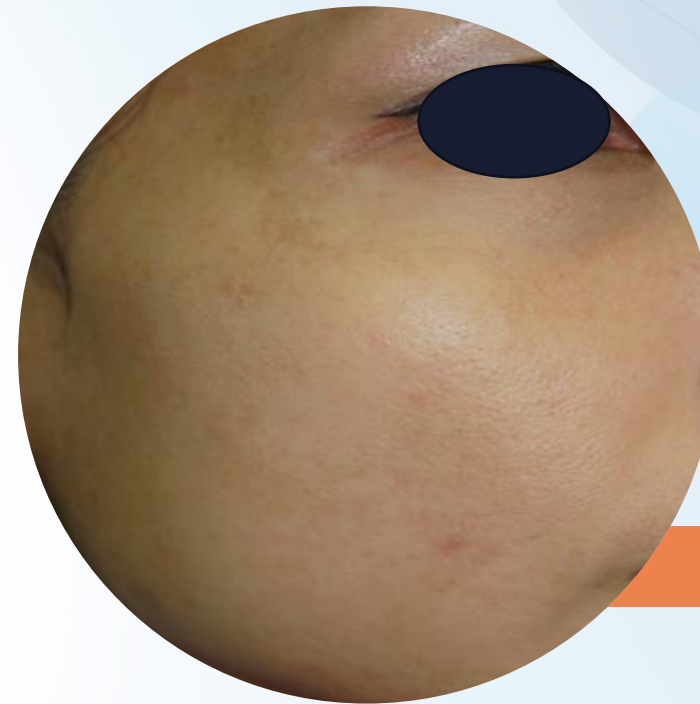
Freckles on arm: Ruby laser



Pigment removal | Results



Before



After 1
month

Ruby laser, 2.5 J/cm²



Pigment removal | Results



Before

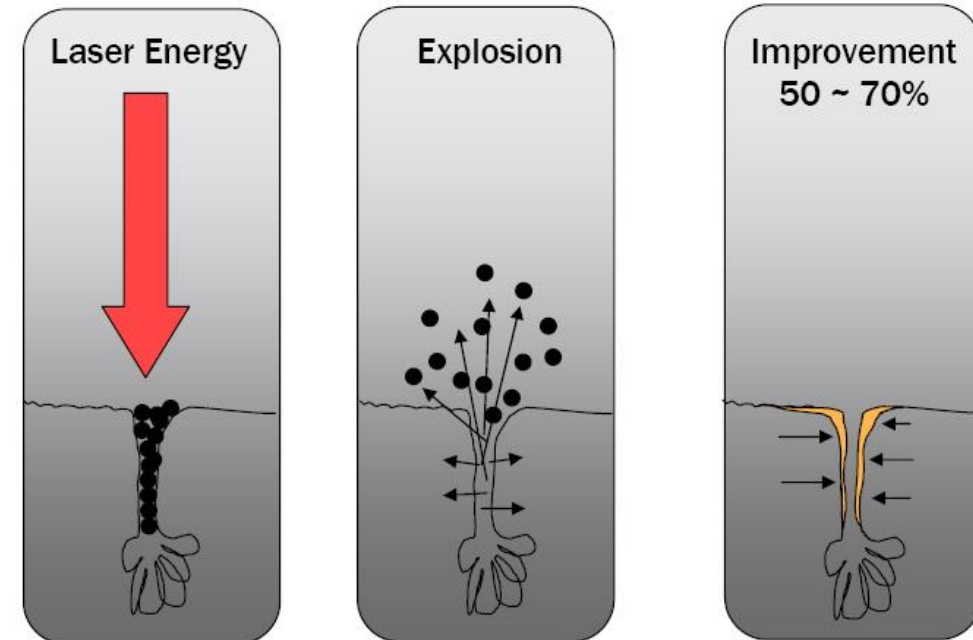
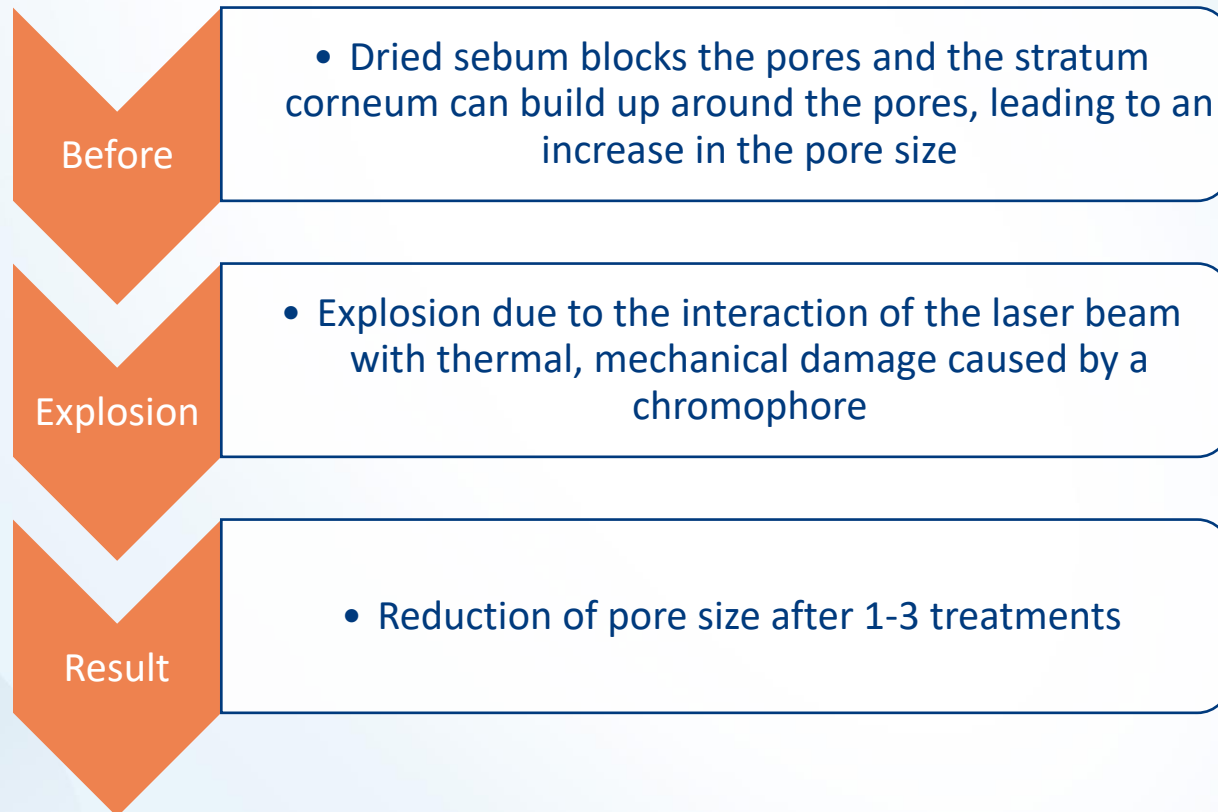


After 1
month

Ruby laser, 2.5 J/cm²



Skin rejuvenation



Skin rejuvenation | Results



Before



After

Results after 3 treatments with a Q-Switched laser from the TattooStar family

Skin rejuvenation | Results

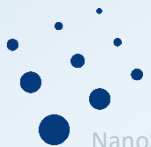


Before

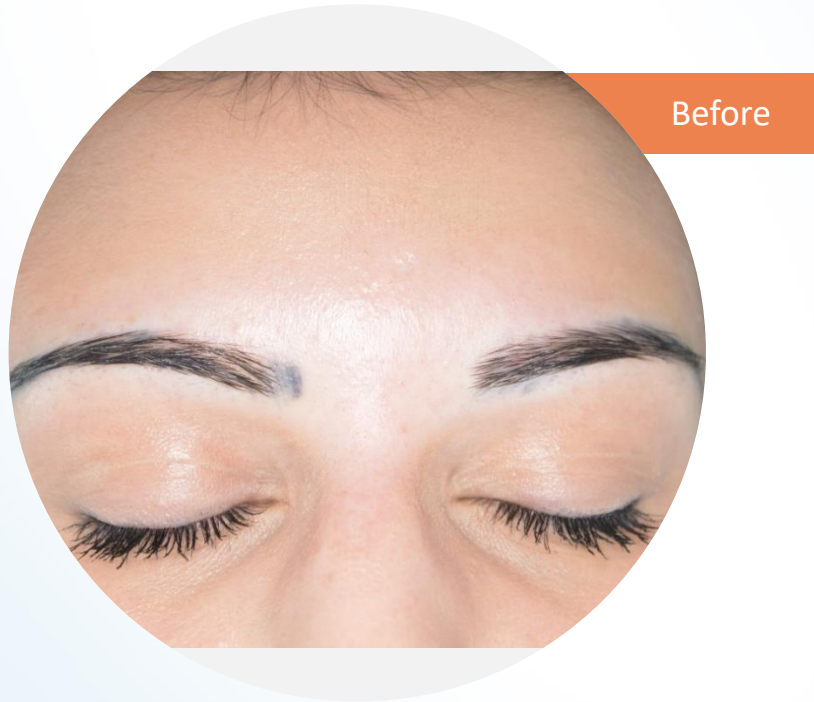


After

Results after 1 treatment with a Q-Switched laser from the TattooStar family



Skin rejuvenation | Results



Skin rejuvenation | Results



Before



After 3 months

Ruby laser, 4 J/cm²



BIBLIOGRAPHY

NANO LASER

Asclepion Laser Technologies works closely with physicians, clinics and universities to evaluate technologies for their efficacy and safety and to improve the application. Scientific questions are answered in clinical studies in a controlled environment. This ensures the best possible results for both the user and the patient.



Bibliography

“Current concepts in aesthetic laser medicine: The 694-nm Q-switched ruby-laser”

Peter Arne Gerber, Said Hilton, Department of Dermatology, Medical Faculty, University of Düsseldorf, Düsseldorf, Germany & Medical Skin Center, Düsseldorf, Germany. Citation: EMJ Dermatol. 2014;2:56-60.

Summary: Today, q-switched laser systems are the gold standard for the removal of tattoos and the treatment of benign pigmented lesions. In our hands, the QSRL has proven itself as a reliable and effective system for the management of a broad variety of indications. Novel techniques and laser-systems grant interesting and novel treatment options for new and experienced users.

“Red ink tattoo reactions: successful treatment with the q-switched 532 nm Nd:YAG laser”

F.C. Anthony et al. (Br J Dermatol 2003; 149: 94-98)

Results: Depigmentation of red tattoos after six sessions on average. After six months of follow-up, treated spots were found to be flat and inconspicuous.

“Removal of tattoos with q-switched ruby laser (694 nm) and q-switched Nd:YAG laser (532 nm and 1064 nm)”

S. Werner et al. (Hautarzt 1999, 50:174-180)

Results: 100% brightening rate in 57% of black and 30% of coloured non-professional tattoos and in 50% of black and 33% of coloured professional tattoos; brightening rates of 70% to 99% in all other patients. Removal of professional tattoos takes more sessions than removal of non-professional tattoos. Removal of coloured tattoos requires a number of sessions similar to that for removal of black tattoos.

“Comparison of the q-switched Alexandrite (755 nm) and q-switched Nd:YAG (1064 nm) lasers in the treatment of benign melanocytic nevi”

A. Rosenbach et al. Dermatol Surg 1997; 23:239-245)

Results: Both lasers yield statistically significant improvement of pigmented lesions, as was confirmed by independent observers. Improvement was more pronounced in the case of the alexandrite laser. (Authors discussed possibility for compensation by selecting other energy densities; study used 6 J/cm² for both lasers.). Reflection measurement showed equally good results for both lasers. A significant reduction in epidermal pigments was histologically verified for both lasers after treatment.

“Tattoo removal with the q-switched ruby laser and the q-switched Nd:YAG laser: a comparative study”

V. J. Levine et al. (Cont Med Educ 1995; 55:291-296)

Phase 1: In 17 of 49 professional tattoos – equally good brightening of black professional tattoos. 18 cases better @ 694 nm, 4 cases better @ 1064 nm. Ruby laser provides better results, if tattoo is green. Also non-professional tattoos were found to respond better to ruby laser.

Phase 2: All red tattoos successfully removed in 1 to 3 sessions using the 532 nm Nd:YAG laser.



Bibliography

“The Efficacy of a Q-Switched 694-nm Ruby Fractional Laser for Treating Acquired Bilateral Nevus of Ota-Like Macules”

Sun Jae Lee, Seung Min Nam, Han Gyu Cha, Eun Soo Park, Yong Bae Kim. Department of Plastic and Reconstructive Surgery, Soonchunhyang Bucheon Hospital, Soonchunhyang University College of Medicine, Bucheon, Korea. Archives of Aesthetic Plastic Surgery 2018;24(1):20-25. Published online: March 12, 2018.

Results: Forty-one patients were female, and three were male. The mean age of the patients was 47.2 years, and the mean follow-up period was 14 months. The median skin pigmentation score was 5 (interquartile range [IQR], 5–6) before laser treatment and 3 (IQR, 3–4) after laser treatment. A statistically significant difference ($P < 0.01$) was found in the skin pigmentation score before and after laser treatment.

Conclusions: This study suggests that, although multiple sessions are required, QS ruby fractional lasers can be considered an effective and less invasive form of treatment of ABNOM.

“Treatment of melasma in Caucasian patients using a novel 694-nm Q-switched ruby fractional laser”

Said Hilton, Heike Heise, Bettina Alexandra Buhren, Holger Schruppf, Edwin Bölke and Peter Arne Gerber. Hilton et al. European Journal of Medical Research 2013, 18:43

Results: At four to six weeks post laser treatment for a mean of 1.4 sessions, we observed a significant ($P = 0.0001$) reduction of the MASI score from 6.54 to 1.98 (72.3%). Patients rated the pain of the intervention at a mean 2.46 points (0=no pain; 10=maximum pain), the improvement at a mean 5.55 points (0=no improvement; 10=maximum improvement) and the overall satisfaction at a mean 4.66 points (0=not satisfied; 10=maximum satisfaction). After three months, post-inflammatory hyperpigmentation (PIH) and/or recurring melasma were observed in 7 (28%) and 11 (44%) patients, respectively.

Conclusion: The 694-nm FRx-QSRL is a safe and effective option for treating melasma in Caucasian patients. Over periods of >3 months, PIH and/or recurring melasma may develop at significant rates and may reduce patient satisfaction. Multiple treatment sessions with lower pulse energies and/or a post-interventional therapy with hypopigmenting ointments and UV protection may help to minimize these complications.

“Use of a Fractional Q-Switched Ruby Laser for Treatment of Facial Lentigines”

Lisa K. Chippis, MD, MS; Joseph W. Diehl; Jonathan M. Schouest, BS; Ronald L. Moy, MD. The American Journal of Cosmetic Surgery Vol. 29, No. 1, 2012

Results: Patients were treated one to two times. All patients experienced clinical improvement in hyperpigmentation with minimal post treatment erythema and crusting.

Conclusions: The fractional Q-switched ruby laser is an ideal treatment for facial lentigines, causing clinical improvement with minimal post treatment morbidity.

“Efficacy of 694-nm Q-switched Ruby Fractional Laser Treatment of Melasma in Female Korean Patients”

Dr Lee, Gowoonsesang Dermatologic Clinic in cooperation with Chung-Ang University, Seoul (2011)

Method: 15 Korean female patients aged 29–50 years (mean 39 years) with Melasma

Conclusion: Treatments provides convincing improvements on superficial pigmentation, also dermal components of pigmentations (Melasma) respond

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