



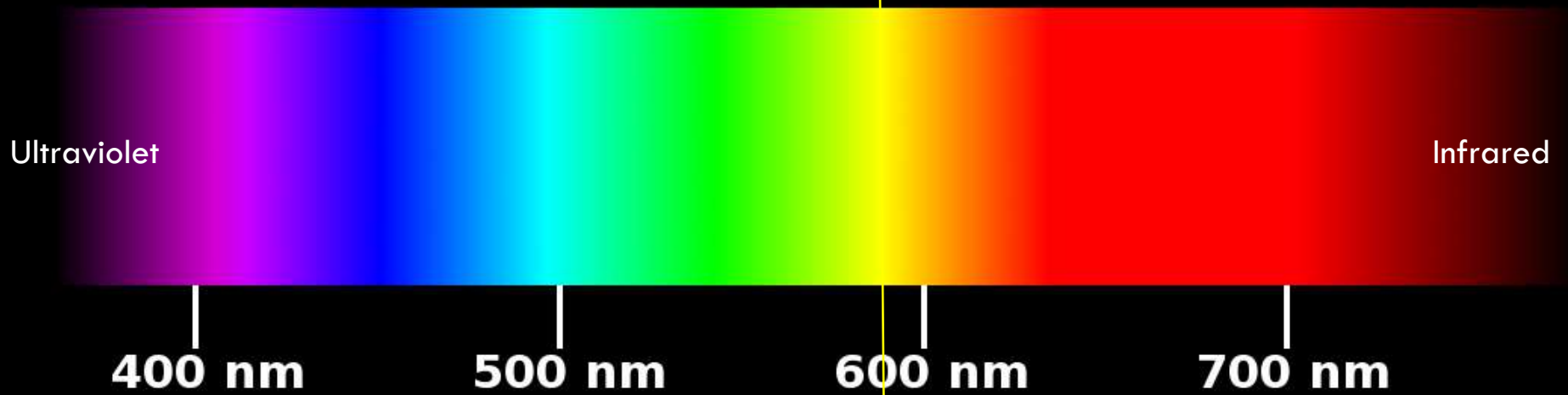
# **YELLOW LASER FOR SKIN DISORDER & REJUVENATION**

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# DISCLOSURE

MOST OF PATIENTS ON THIS PRESENTATION WERE TREATED BY  
QUANTA SYSTEM 585 NM, DISTRIBUTED BY HERCA INDONESIA

# COLOR SPECTRAL



| <b>Color</b>  | <b>Wavelength</b> |
|---------------|-------------------|
| <b>violet</b> | 380–450 nm        |
| <b>blue</b>   | 450–495 nm        |
| <b>green</b>  | 495–570 nm        |
| <b>yellow</b> | 570–590 nm        |
| <b>orange</b> | 590–620 nm        |
| <b>red</b>    | 620–750 nm        |



577 nm

Diode

578 nm

Copper Bromide

585/595 nm

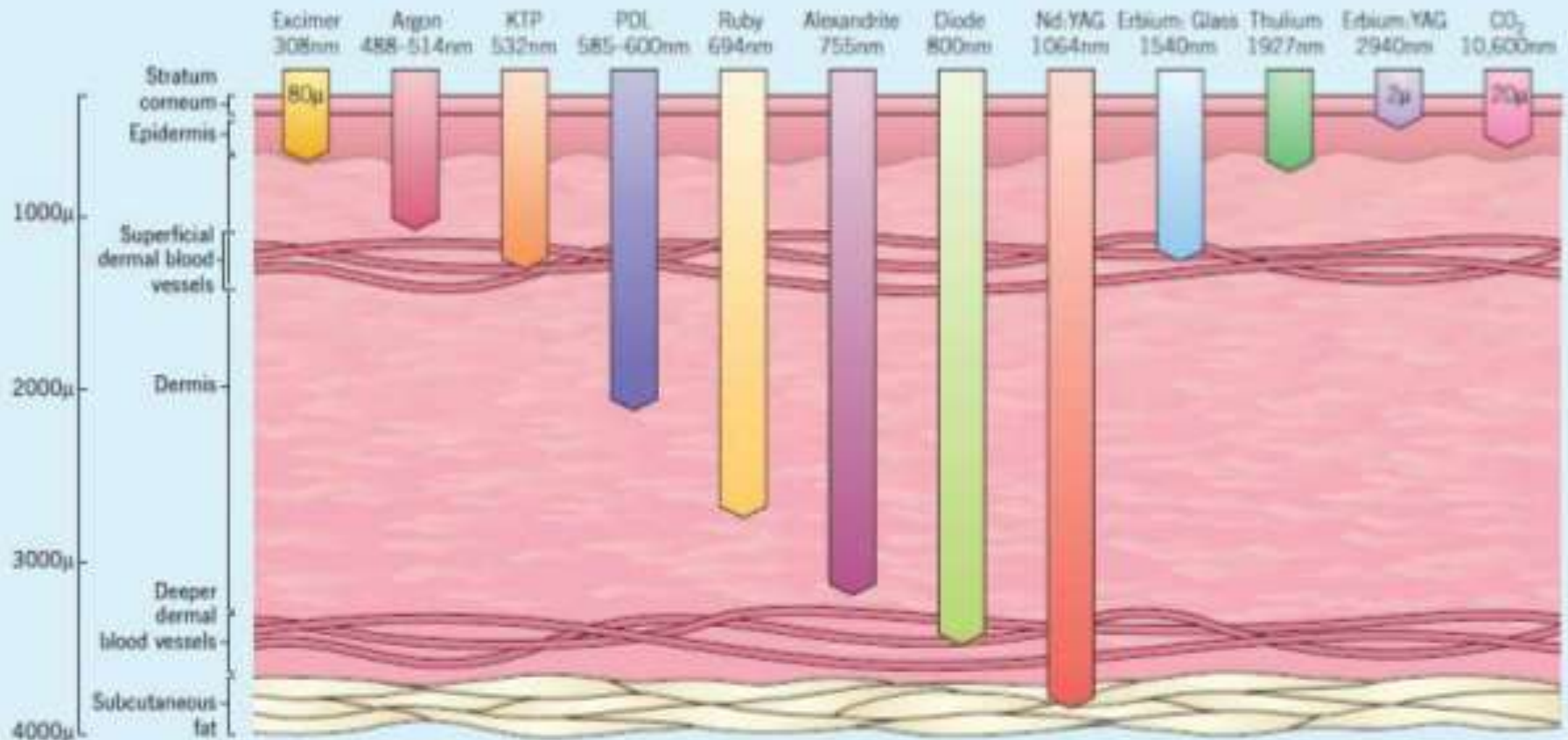
Pulsed Dye Laser

**Table I.** Types of lasers and their cutaneous application

| Lasers type                         | Wavelength  | Cutaneous application  |
|-------------------------------------|-------------|--|
| Argon (CW)                          | 418/514 nm  | Vascular lesions   |
| Argon-pumped tunable dye (quasi-CW) | 577/585 nm  | Vascular lesions   |
| Copper vapor/bromide (quasi-CW)     | 510/578 nm  | Pigmented lesions, vascular lesions  |
| Potassium-titanyl-phosphate         | 532 nm      | Pigmented lesions, vascular lesions  |
| Nd: YAG, frequency-doubled          | 532 nm      | Pigmented lesions, red/orange/yellow tattoos   |
| Pulsed dye                          | 510 nm      | Pigmented lesions  |
|                                     | 585-595 nm  | Vascular lesions, hypertrophic/keloid scars, striae, verrucae, nonablative dermal remodeling |
| Ruby                                | 694 nm      |  |
| QS                                  |             | Pigmented lesions, blue/black/green tattoos  |
| Normal mode                         |             | Hair removal   |
| Alexandrite                         | 755 nm      |  |
| QS                                  |             | Pigmented lesions, blue/black/green tattoos  |
| Normal mode                         |             | Hair removal, leg veins  |
| Diode                               | 800-810 nm  | Hair removal, leg veins  |
| Nd:YAG                              | 1064 nm     |  |
| QS                                  |             | Pigmented lesions, blue/black tattoos  |
| Normal mode                         |             | Hair removal, leg veins, nonablative dermal remodeling                                       |
| Nd:YAG, long-pulsed                 | 1320 nm     | Nonablative dermal remodeling  |
| Diode, long-pulsed                  | 1450 nm     | Nonablative dermal remodeling, acne  |
| Erbium:glass                        | 1540 nm     | Nonablative dermal remodeling  |
| Erbium:YAG (pulsed)                 | 2490 nm     | Ablative skin resurfacing, epidermal lesions   |
| Carbon dioxide (CW)                 | 10,600 nm   | Actinic cheilitis, verrucae, rhinophyma  |
| Carbon dioxide (pulsed)             | 10,600 nm   | Ablative skin resurfacing, epidermal/dermal lesions  |
| Intense pulsed light source         | 515-1200 nm | Superficial pigmented lesions, vascular lesions, hair removal, nonablative dermal remodeling |

CW, Continuous-wave; Nd, neodymium; QS, quality-switched; YAG, yttrium-aluminum-garnet.

## DEPTH OF OPTICAL PENETRATION BY VARIOUS LASERS



The depth of optical penetration for CO<sub>2</sub> lasers is only ~20 microns, but **FRACTIONAL CO<sub>2</sub> LASERS** can vaporize nearly full-thickness microchannels through the dermis

# LASER

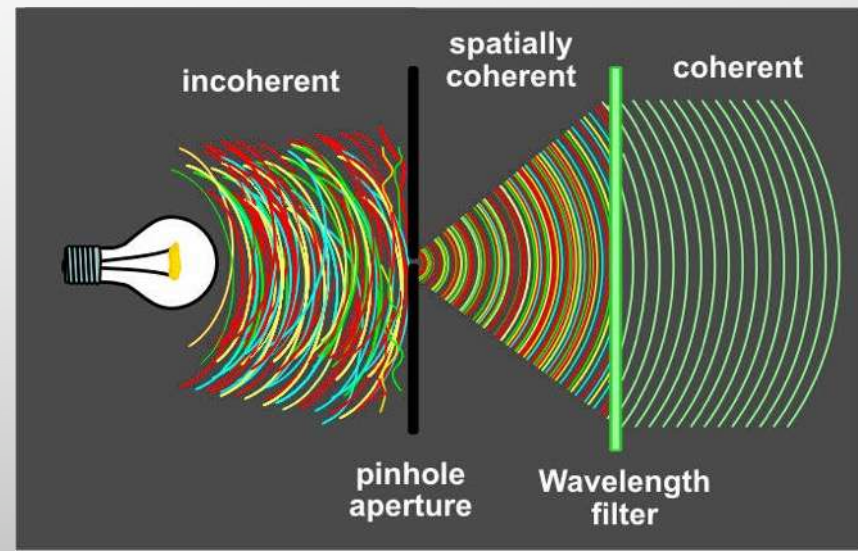
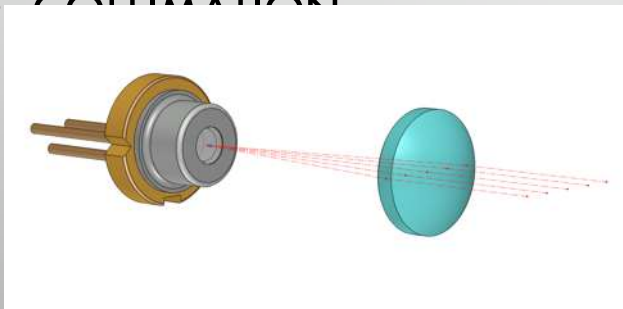
- LIGHT
- AMPLIFICATION BY
- STIMULATED
- EMISSION OF
- RADIATION

# LASER

- MONOCHROMATIC
  - THE WAVELENGTH OF LIGHT PRODUCED BY A LASER DEPENDS ON THE LASING MEDIUM IN THE OPTICAL CAVITY
  - LASING MEDIUM : SOLID, LIQUID, GAS
  - A CERTAIN WAVELENGTH OF LIGHT, SPECIFIC ABSORPTION OF CHROMOPHORES.

- COHERENCE

- COLLIMATION





# DYE LASER?

- A LASER WHICH USES AN ORGANIC DYE AS THE LASING MEDIUM, USUALLY AS A LIQUID SOLUTION.
- SINCE 20 YEARS, 585 NM LASERS ARE COMMONLY USED IN DERMATOLOGY FOR VASCULAR TREATMENTS AND ARE CONSIDERED HAS THE ELECTIVE, GOLD STANDARD WAVELENGTH FOR THOSE APPLICATIONS.
- 585 NM LASERS ARE ALSO USED IN AESTHETICS FOR SKIN TREATMENTS AND ARE CONSIDERED VERY EFFECTIVE WHEN PIGMENTATION DISORDERS WITH MELANIN OR VASCULAR COMPONENTS ARE ASSOCIATED WITH AGED SKIN.

# WHY 585 NM?

- OXYHAEMOGLOBINE HAS 3 PEAKS FOR LIGHT ABSORPTION
  - 418NM (THE STRONGEST)
  - 542 NM
  - 577NM (THE DEEPEST & LEAST ABSORBED BY MELANIN)
- 585NM WAS FOUND TO BE DEEPER THAN 577NM & LESS ABSORBED BY MELANIN

# IN THE PAST..

- 585 NM , CAUSING POST-TREATMENT PURPURA FOR 7-10 DAYS, ALSO RISKY FOR PIH WHEN ASIAN OR DARK SKINS ARE TREATED
- DYE LASERS WAS CAUSING PURPURA DUE TO THE HIGH PEAK POWER WHICH CAUSES FAST HB EXPANSION THAT BRAKES THE VESSEL'S WALL AND THE LEAKAGE OF BLOOD IN THE SKIN



IN THE PAST..

DYE LASERS HAVE CONSTANT AND EXPENSIVE NEEDS IN TERMS OF SERVICE MAINTENANCE. THE ESTIMATED RUNNING COST IS > 5.000 \$ YEAR JUST FOR RHODAMINE REPLACEMENTS.



Dye Kits

# MILLENNIAL ERA..

- MILLENNIAL TECHNOLOGY
- **D-WMOPS™**  
(DIFFERENTIAL - WAVELENGTH  
MODIFIED OPTICALLY PUMPED  
SEMICONDUCTOR)
- **LASER** ABLE TO EMIT THE SAME  
WAVELENGTH OF A DYE EITHER IN  
CONTINUOUS OR PULSED MODES
- **NO PURPURA** AND **WITHOUT ANY  
MAINTENANCE** AND CONSUMABLE  
COSTS



Quanta System 585 nm

# SELECTIVE PHOTOTHERMOLYSIS

- SELECTIVE PHOTOTHERMOLYSIS
- COMPLETE HEATING IS ACHIEVED WITHOUT RISKS OF THERMAL DAMAGE OF THE SURROUNDING TISSUES
  - WAVELENGTH
  - PULSE DURATION ( $\leq$  TRT)
  - FLUENCE
- THE ABSORPTION FROM THE VASCULAR AND PIGMENTED TARGETS CREATES A THERMAL DIFFUSION IN THE SURROUNDING TISSUE → STIMULATION IN SKIN COLLAGEN PRODUCTION → IMPROVEMENT OF SKIN TEXTURE
- SPECIFIC REDUCTION OF CAPILLARIES AND PIGMENTATION

# THERMAL RELAXATION TIME

|                     | Size, $\mu\text{m}$ | Thermal relaxation times (approx.) |
|---------------------|---------------------|------------------------------------|
| Tattoo ink particle | 0.5–4               | 10 ns                              |
| Melanosome          | 0.5–1               | 1 $\mu\text{s}$                    |
| Erythrocyte         | 7                   | 2 $\mu\text{s}$                    |
| Blood vessel        | 50                  | 1 ms                               |
| Blood vessel        | 100                 | 5 ms                               |
| Blood vessel        | 200                 | 20 ms                              |
| Hair follicle       | 200                 | 10–100 ms                          |

# INDICATION

- Vascular lesions, telangiectasia, spider angioma
- Pigmented lesions, Melasma
- Verrucae, warts
- Fibroma
- Wrinkles / Fine lines
- Seborrheic keratosis
- Red scars
- PWS and Haemangioma



# SKIN REJUVENATION

- the absorption from the vascular and pigmented targets creates a thermal diffusion in the surrounding tissue, with a stimulation in the collagen production → improvement of the skin texture
- the photorejuvenation is global, with a specific reduction of capillaries and hyperpigmentation, simultaneously to the texture improvement.



# CONCLUSION

- YELLOW LASER , GOLD STANDARD FOR VASCULAR LESIONS AND GOOD FOR PIGMENT.
- AGING PROBLEMS MOSTLY UNEVEN SKIN TONE, REDNESS ON THE FACE, FINE CAPILLARIES.
- YELLOW LASER SHOWED INSTANT REJUVENATION FOR PROBLEMS ABOVE.
- NO DOWNTIME, NO MORE PURPURA.
- HAPPY PATIENTS, HAPPY DOCTOR.
- SAFETY FIRST.

**! DANGER**

**Approved  
Laser  
Protection:**



**Laser Radiation  
Class 4.**

**Avoid eye or skin  
exposure to direct or  
scattered radiation.**

**Laser protective  
eyewear required.**

**100-35-205**

OD 5+ @ 850-1000 nm  
OD 7+ @ 1000-1400 nm  
OD 5+ @ 1800-2400 nm  
OD 4+ @ 2400-2900 nm  
OD 5+ @ 2900-10600 nm



Manufactured in the USA 



**Terima Kasih**