

# **Micro Lens Array Data**

**2016-09-09**

**R&D**

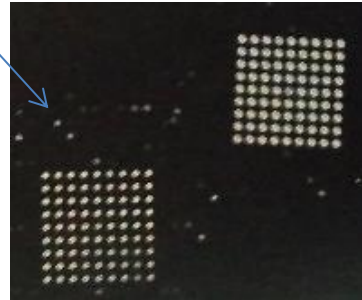
**Yoo Han Young**

# PICO CARE MLA Beam

**DOE**

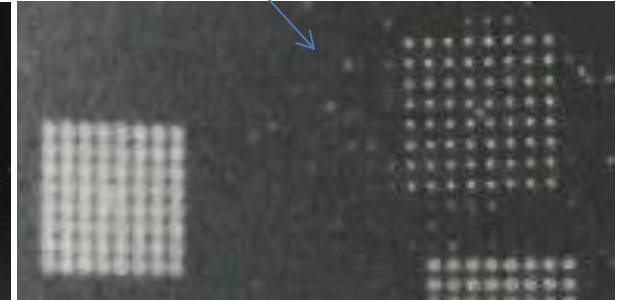


**1064 nm**

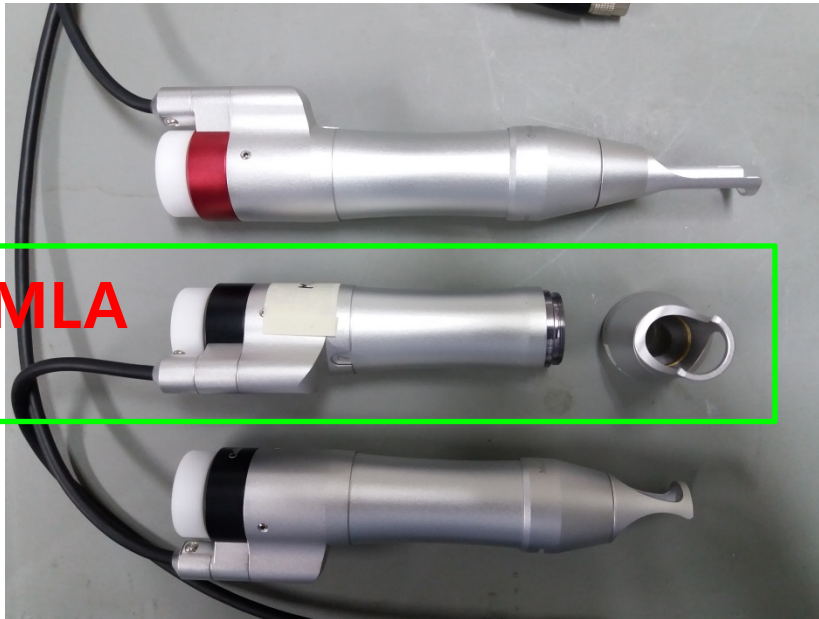


Scattered Beam

**532 nm**



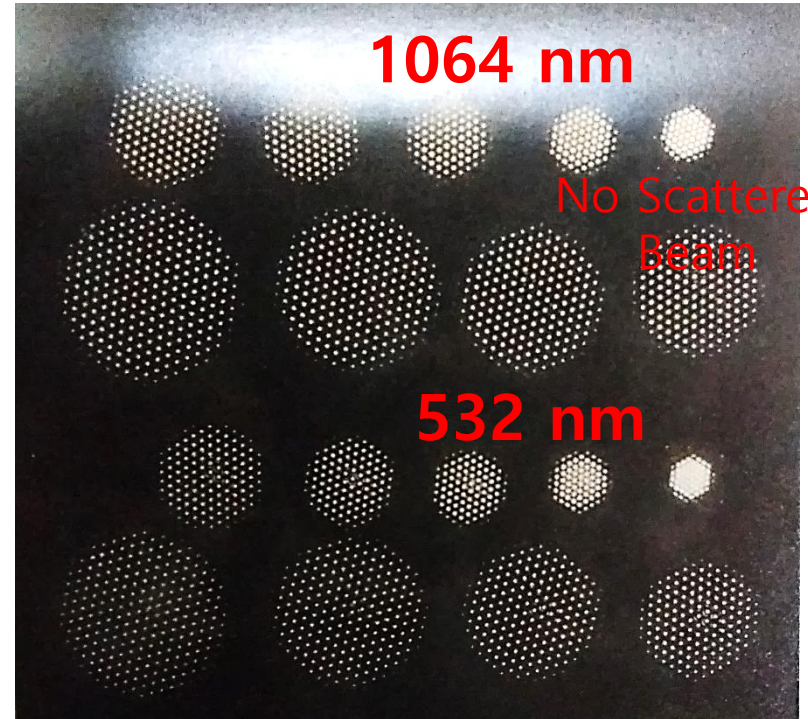
**MLA**



**1064 nm**

No Scattered Beam

**532 nm**





# PICO CARE MLA Beam

Align Paper

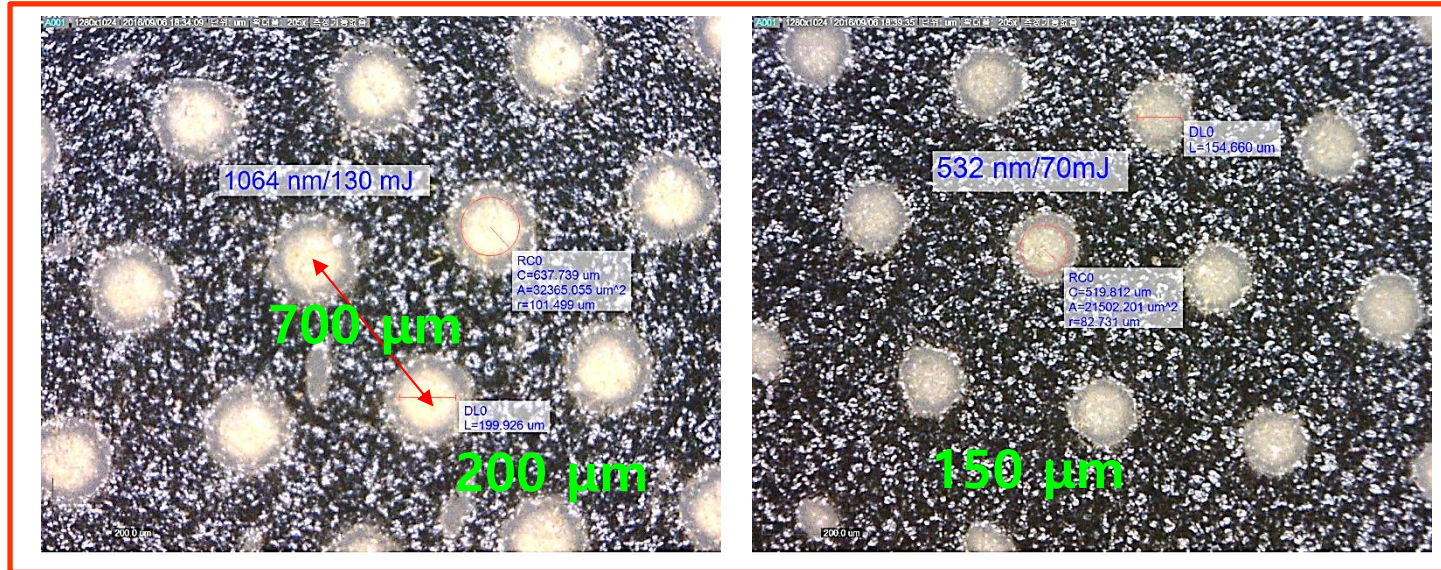
Enlarged Photo



DOE



MLA





# PICO CARE MLA Beam shot on skin

1 Hour after shot

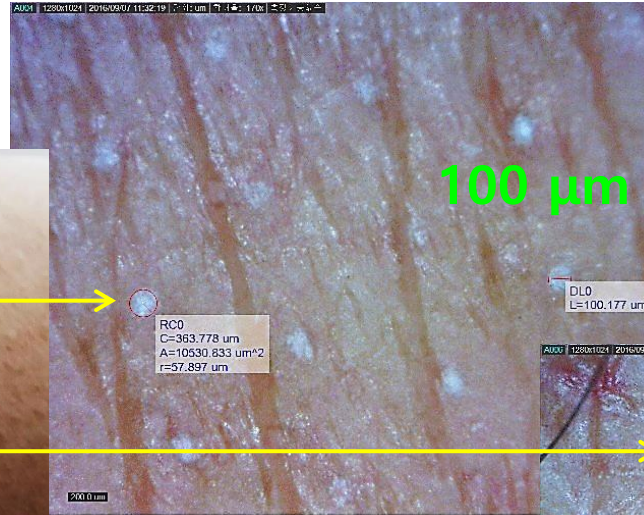
532 nm  
(7mm/70mJ)

1064 nm  
(7mm/230mJ)

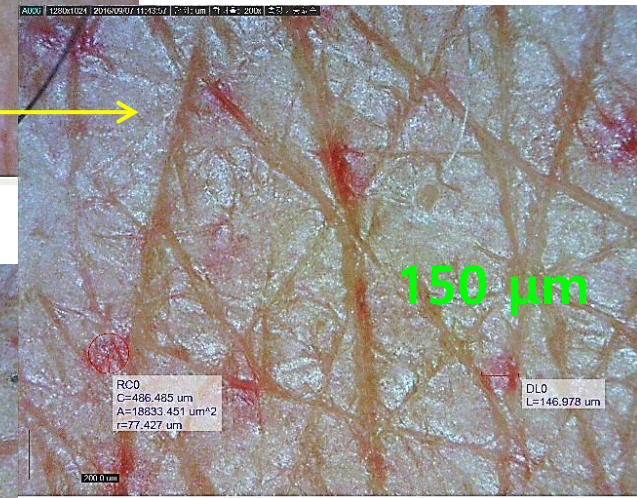
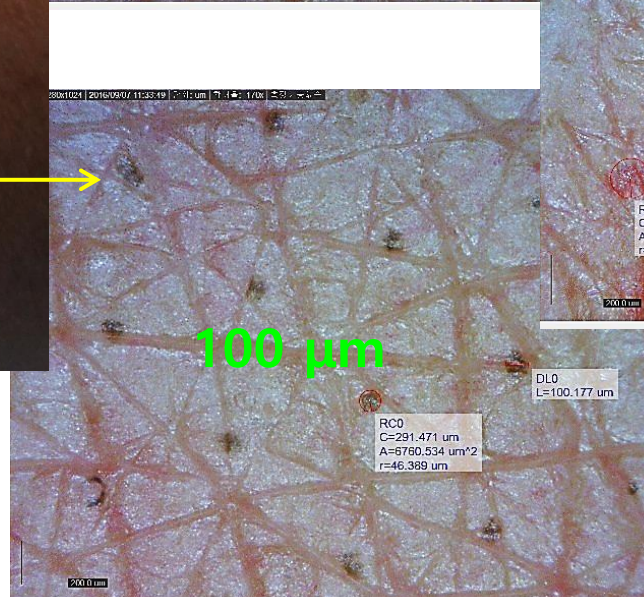
532 nm

24 hour after shot

Superficial Skin Photo(Arm)



Magnified Photo  
(Dino-Lite Microscope)





# Clinical Prediction

**Picoway** Maximise treatment with no  
Epidermal damage,

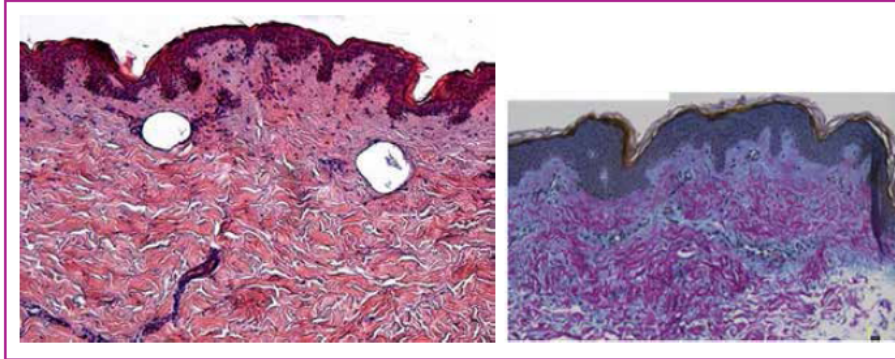
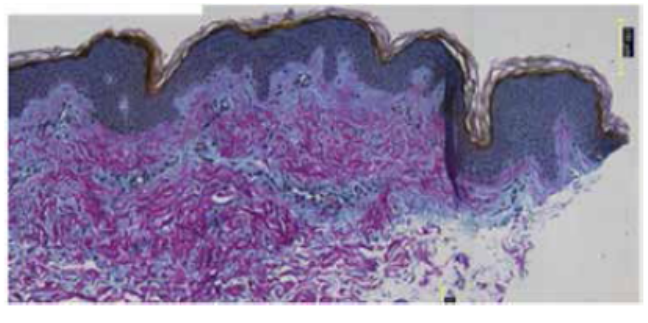


Figure 1 (Left panel): H&E stain section of skin tissue showing 0.2mm diameter vacuoles in the upper d laser-induced optical breakdown. The tissue section was taken immediately after laser irradiation. (Right section stained with Herovici stain to show new collagen formation from healing of LIOB damage. The sam 30 days after laser irradiation.<sup>9</sup>



owing 0.2mm diameter vacuoles in the upper dermis caused by taken immediately after laser irradiation. (Right panel): Tissue rmmation from healing of LIOB damage. The sample was biopsied

**Light-Induced optical air breakdown→  
Collagen regeneration**  
(Shorter the pulse higher the peak power

Picosure

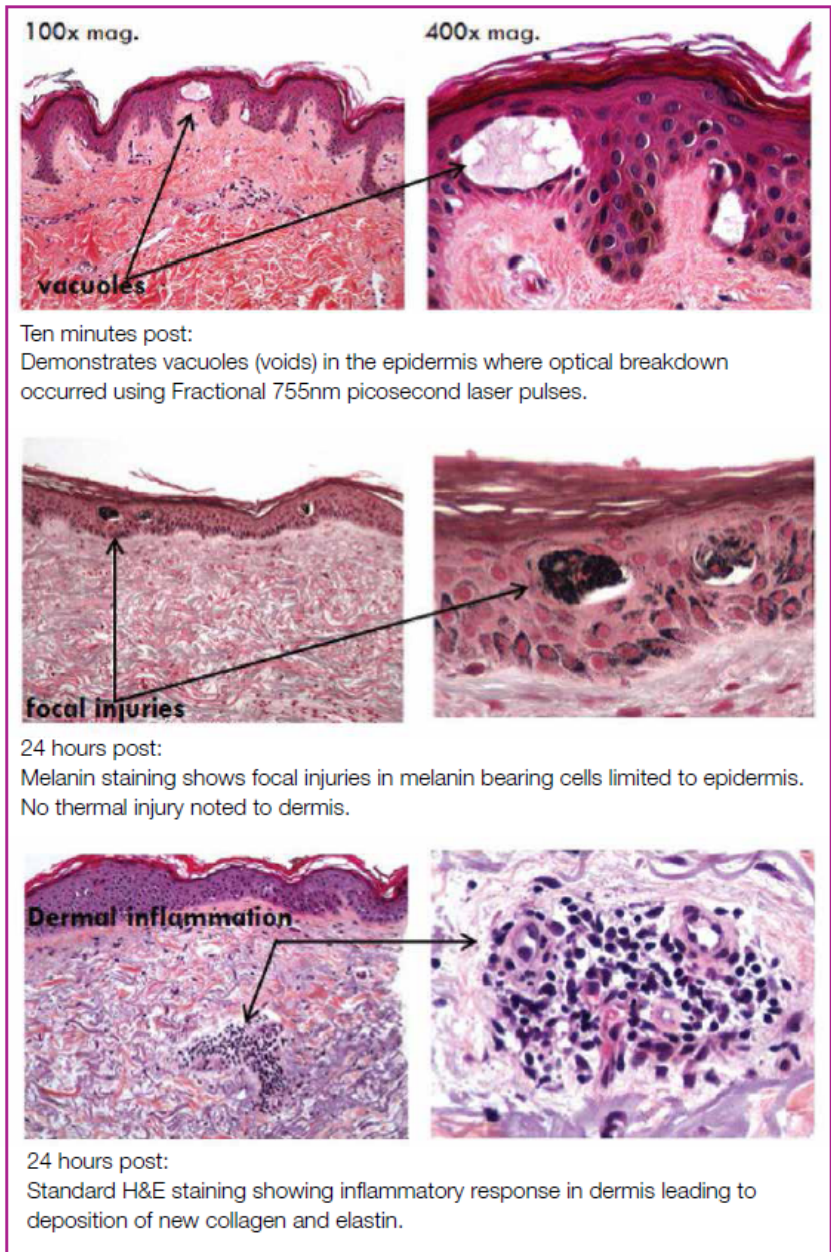


Figure 2: Histologic assessment of skin changes from fractional 755nm picosecond laser pulses.<sup>6</sup>

# Clinical Example



before

1 week after

1 month after

3 months after

Micro/deep Wrinkle, Skin Tightening, Scar treatment, Improves Skin tone..



Before

After

PicoSure Focus Skin Rejuvenation, 4 Tx

Photo Courtesy of Cynosure and R. Weiss, MD

# MLA vs. Zoom H/P P.P Density

Pico second pulse comparison

1064nm (750 ps)

532 nm H/P (750 ps)

Handpiece	Parameters	Value	Simbol
(1064nm/7mm Fractional. H/P)	Energy	140	mJ
	Energy/Spot	1	mJ
	Peak Power	1.3333333	MW
	Spot Size	150	um
	Area	0.0001766	cm <sup>2</sup>
	<b>Peak Power Density</b>	<b>7548.9502</b>	<b>MW/cm<sup>2</sup></b>
(1064nm/7mm Zoom H/P)	Energy	140	mJ
	Energy/Spot	140	mJ
	Peak Power	186.66667	MW
	Spot Size	7	um
	Area	0.38465	cm <sup>2</sup>
	<b>Peak Power Density</b>	<b>485.28966</b>	<b>MW/cm<sup>2</sup></b>
<b>Result</b>	<b>Fx. H/P P.P Density &gt; ~ 15</b>		

Handpiece	Parameters	Value	Simbol
(532nm/7mm Fractional. H/P)	Energy	70	mJ
	Energy/Spot	0.5	mJ
	Peak Power	0.66666667	MW
	Spot Size	100	um
	Area	0.0000785	cm <sup>2</sup>
	<b>Peak Power Density</b>	<b>8492.569</b>	<b>MW/cm<sup>2</sup></b>
(532nm/7mm Zoom H/P)	Energy	70	mJ
	Energy/Spot	70	mJ
	Peak Power	93.3333333	MW
	Spot Size	7	um
	Area	0.38465	cm <sup>2</sup>
	<b>Peak Power Density</b>	<b>242.644829</b>	<b>MW/cm<sup>2</sup></b>
<b>Result</b>	<b>Fx. H/P P.P Density &gt; ~ 35</b>		

- MLA has Approx. **15 times** higher (**1064 nm**) compare to Single Spot H/P **Peak Output Density**

- MLA has Approx. **35 times** higher (**1064 nm**) compare to Single Spot H/P **Peak Output Density**



# MLA vs. Zoom H/P P.P Density

Pico Second vs. Nano Second  
Pulse Comparison

1064nm (750 ps vs. 10 ns)

532 nm H/P (750 ps vs. 10 ns)

Handpiece	Parameters	Value	Simbol	Handpiece	Parameters	Value	Simbol
(1064nm/7mm Fractional. H/P)	Energy	140	mJ	(532nm/7mm Fractional. H/P)	Energy	70	mJ
	Energy/Spot	1	mJ		Energy/Spot	0.5	mJ
	Peak Power	1.33333333	MW		Peak Power	0.666666667	MW
	Spot Size	150	um		Spot Size	100	um
	Area	0.00017663	cm <sup>2</sup>		Area	0.0000785	cm <sup>2</sup>
	<b>Peak Power Density</b>	<b>7548.95</b>	<b>MW/cm<sup>2</sup></b>		<b>Peak Power Density</b>	<b>8492.569</b>	<b>MW/cm<sup>2</sup></b>
(1064nm/7mm Zoom H/P)	Energy	140	mJ	(532nm/7mm Zoom H/P)	Energy	70	mJ
	Energy/Spot	140	mJ		Energy/Spot	70	mJ
	Peak Power	14	MW		Peak Power	7	MW
	Spot Size	7	um		Spot Size	7	um
	Area	0.38465	cm <sup>2</sup>		Area	0.38465	cm <sup>2</sup>
	<b>Peak Power Density</b>	<b>36.39672</b>	<b>MW/cm<sup>2</sup></b>		<b>Peak Power Density</b>	<b>18.198362</b>	<b>MW/cm<sup>2</sup></b>
Result	<b>Fx. H/P P.P Density&gt; ~ 207 !!!</b>			Result	<b>Fx. H/P P.P Density&gt; ~ 466 !!!</b>		

- MLA has Approx. **207 times** higher (**1064 nm**) compare to Single Spot H/P **Peak Output**

**Density**

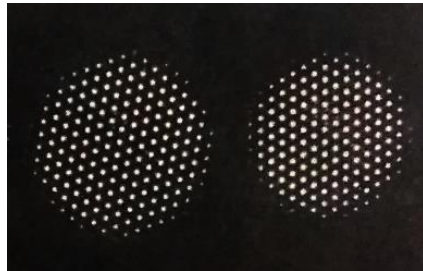
- MLA has Single Approx. **466 times** higher (**1064 nm**) compare to Single Spot H/P **Peak Output**

**Density**

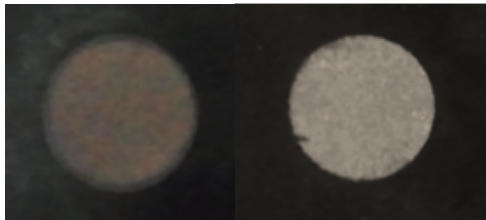


# MLA Expected effect

MLA H/P  
7mm/140 ea



Zoom H/P  
7mm/1 ea



Handpiece	Parameters	Value
(1064nm/7mm Fractional. H/P)	Energy	140 mJ
	Energy/Spot	1 mJ
	Peak Power/Spot	1.3 MW
	Spot Size	150 um
	Area	0.000176625 cm <sup>2</sup>
	<b>Peak Power Density</b>	<b>7.3 GW/cm<sup>2</sup></b>
(1064nm/7mm Zoom H/P)	Energy	140 mJ
	Energy/Spot	140 mJ
	Peak Power/Spot	187 MW
	Spot Size	7 mm
	Area	0.38465
	<b>Peak Power Density</b>	<b>0.486 GW/cm<sup>2</sup></b>
Result	<b>Fx. H/P P.P Density &gt; ~ 15 !!!</b>	

- MLA (7mm) has ~ 15 times higher compare to single spot Zoom H/P on P.P Density
- When treating pigment, Light-induced Optical air destruction Threshold Peak Power is 1 ~ 10 GW/cm<sup>2</sup>
- [MLA in Picocare effectively act on Light-induced optical destruction](#)

Threshold

# Picocare Device components



Picocare 본체 & Zoom H/P



Collimation H/P (6, 7, 8 mm)



Fractional 1064 nm H/P (5x5 ~ 9x9 mm)



Fractional 532 nm H/P (6x6 mm)



585nm



595nm



660nm

Dye H/P

3 mm



Zoom & MLA H/P



Collimation H/P



Dye H/P (3 types)