

Clinical Case Report

The TruScan Pro Yellow Laser in Advanced Retinal Management

SP-Mode® Microsecond Laser Technology

577nm Yellow | Pattern Scanning Photocoagulation

By: Miguel Rechichi, MD, PhD

Key Points:

- 577nm yellow wavelength provides superior RPE selectivity with ~50% less power than green lasers.
- SP-Mode® 5% duty cycle enables safe, sub-threshold treatment of the fovea without thermal damage.
- Pattern scanning with micro-joystick control optimizes workflow in high-volume clinics.
- Clinical cases demonstrate efficacy across CSCR, dry AMD, post-surgical fluid, macular edema, and RVO.
- Single platform addresses ~90% of common retinal diseases, reducing equipment costs.

Abstract

The clinical case portfolio presents real-world experience with the TruScan Pro pattern scanning photocoagulator featuring SP-Mode® Microsecond Laser Technology and the 577nm yellow wavelength. Drawing on clinical practice at Centro Polispecialistico Mediterraneo, Dr. Miguel Rechichi demonstrates the platform's versatility across five distinct retinal pathologies, including post-surgical residual fluid, central serous chorioretinopathy, drusenoid detachment, Irvine-Gass Syndrome, and refractory macular edema secondary to retinal vein occlusion. The cases illustrate how SP-Mode® shifts the treatment paradigm from thermal ablation to RPE stimulation, enabling safe foveal treatment and reducing dependence on repeated intravitreal injections.

Versatile Design for Modern Retinal Practice

In the demanding environment of private retinal practice, technology selection directly impacts both clinical outcomes and operational viability. The TruScan Pro represents a paradigm shift in photocoagulation, a multi-modal platform that functions as the retinal specialist's most versatile instrument. Rather than requiring separate laser systems for each pathology, the TruScan Pro consolidates capabilities into a single, cost-effective platform.

The system delivers the refined precision required for delicate macular work while maintaining robust performance for far-peripheral treatment. Clinical experience demonstrates that this device addresses approximately 90% of common retinal diseases, expanding the clinical repertoire of any practice. This versatility is built upon the unique biological advantages of the 577nm yellow wavelength combined with LIGHTMED's proprietary SP-Mode® Microsecond Laser Technology.

Feature	Yellow 577nm	Green 532nm
RPE Selectivity	Superior, highly selective for RPE melanin	Standard
Xanthophyll Absorption	Minimal, safer near macula	Significant
Power Required	~50% less than green for equivalent effect	Standard
Macular Safety Margin	Significantly increased, foveal access enabled	Limited approach to fovea
Photoreceptor Risk	Reduced	Higher

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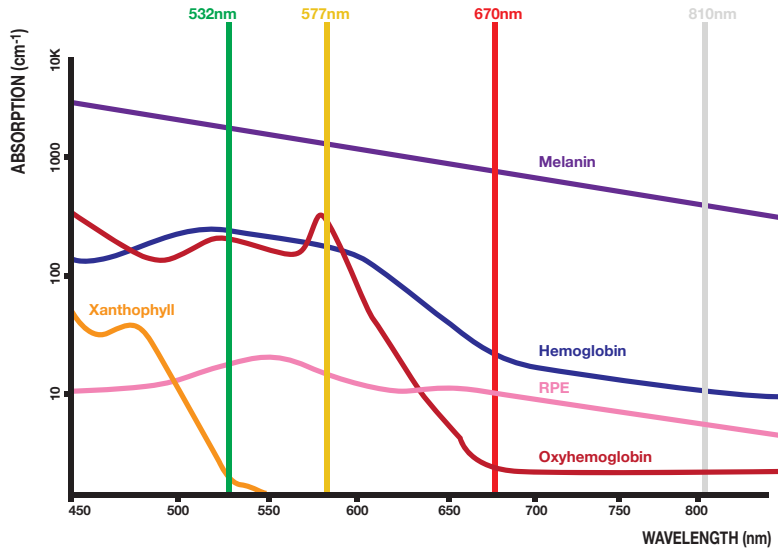


Figure 1: Yellow 577nm wavelength absorption profile showing peak selectivity for melanin and oxyhemoglobin with minimal xanthophyll absorption.

Technological Differentiators: Yellow Wavelength & SP-Mode®

577nm Yellow Wavelength Advantages

The transition from traditional green lasers to the 577nm yellow wavelength represents a fundamental upgrade in safety and selectivity. Yellow light provides superior selectivity for the Retinal Pigment Epithelium (RPE) without the xanthophyll absorption characteristic of shorter wavelengths. This makes it significantly safer for macular treatments, by reducing collateral damage to the photoreceptor layer.

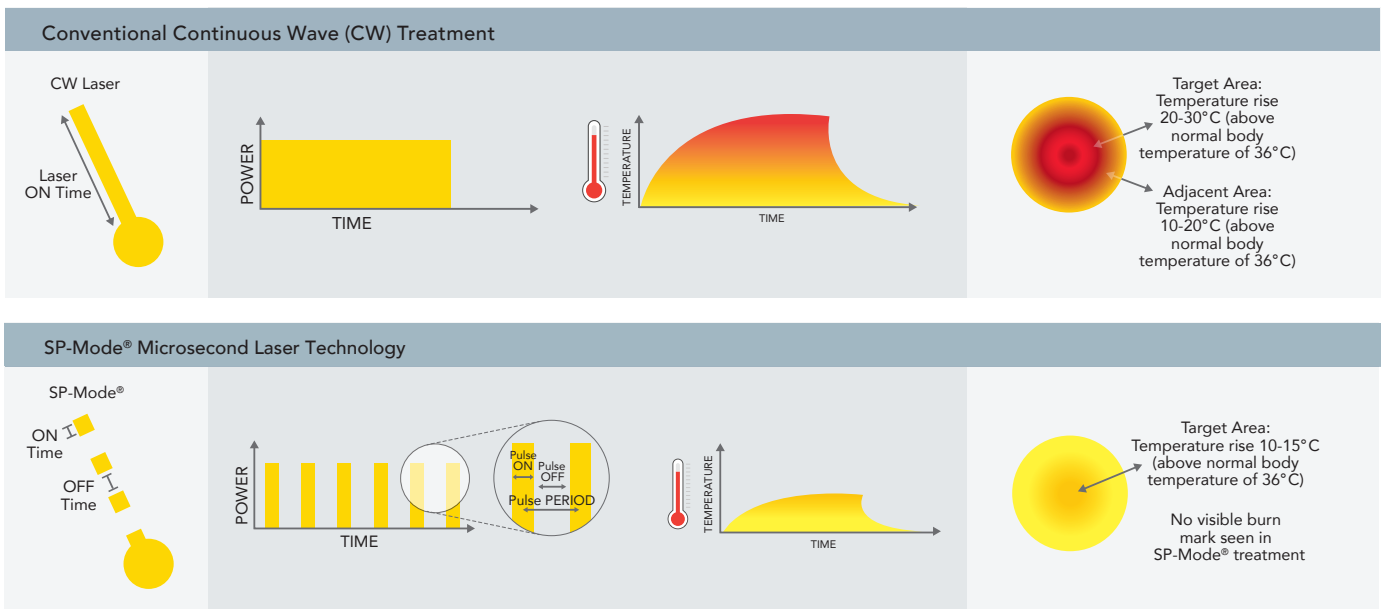


Figure 2: Conventional CW laser vs. SP-Mode® Microsecond Laser Technology, demonstrating reduced thermal spread and no visible burn marks.

SP-Mode® Microsecond Laser Technology

The most transformative feature of the TruScan Pro platform is SP-Mode® Microsecond Laser Technology, which utilizes a 5% duty cycle titration of the full threshold laser. By delivering energy in precisely controlled micro-pulses, SP-Mode® prevents the temperature rise that causes conventional thermal tissue damage. This enables direct treatment of the fovea and foveovascular membranes without thermal destruction, shifting the clinical paradigm from ablation to stimulation.

SP-Mode® shifts the treatment goal from ablation to stimulation, using laser energy to reboot RPE cells and trigger biological reabsorption of fluid.

The mechanism leverages laser energy to stimulate RPE cellular activity and trigger biological reabsorption of fluid, rather than creating destructive photocoagulation burns. Clinical experience confirms that this approach enables treatment of pathologies previously considered too delicate for laser intervention.

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Workflow Optimization: Pattern Scanning & Ergonomic Control

In high-volume retinal clinics, speed and precision are clinical necessities. The TruScan Pro optimizes the surgeon's experience through automated pattern delivery, enabling complex treatments to be executed in seconds, critical for both patient comfort and clinic throughput.

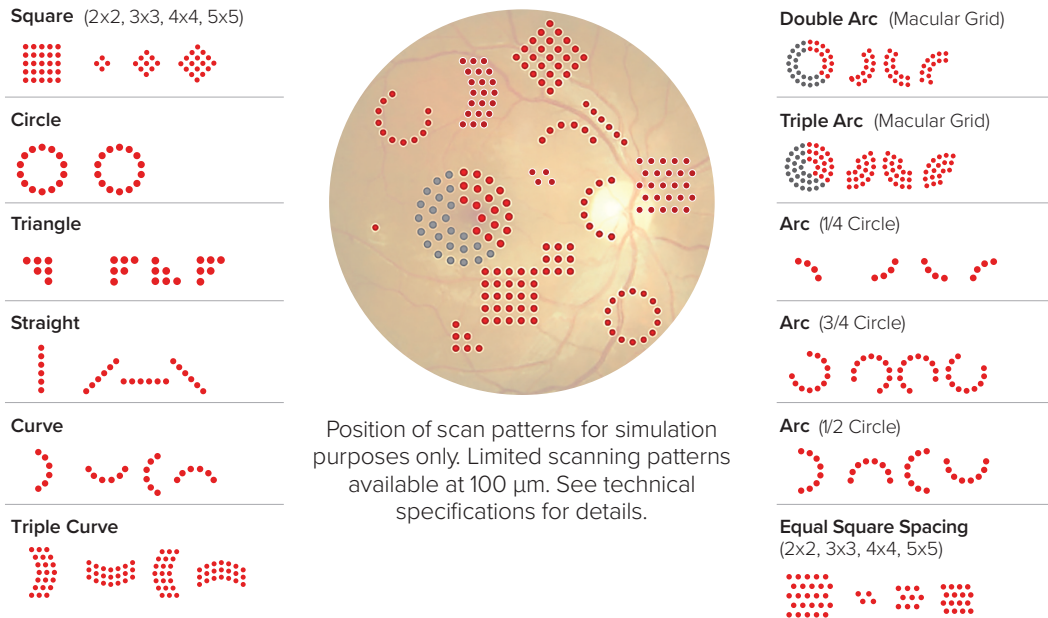


Figure 3: TruScan Pro pattern scanning options: square, circle, triangle, arc, curve, and macular grid configurations for precise lesion coverage.

Feature	Clinical Benefit
Heads Up Display (HUD)	Improves precision and confidence during retinal procedures by enabling continuous visualization of treatment settings maintaining full focus on the patient.
Micro-Joystick Control	Integrated into the slit lamp for fingertip control of the laser pattern. Essential for peripheral lesions in non-collaborative patients. Move the pattern while maintaining patient gaze position.
Customizable Patterns	Instantly select and customize shapes with finger-control presets. Square, triangle, arc, curve, circle, and macular grid configurations ensure laser geometry matches pathology precisely.
3D Mouse	Improves treatment efficiency and precision by enabling intuitive, real-time control of laser patterns—including rotation, spacing, and radius—with adjustment of power, duration, and interval settings without interrupting workflow.
Advanced LCD Touchscreen	Built-in patient reporting with automated parameter logging, integrated computer for file export, and storage for preferred treatment settings.
Foot Pedal with Power Control	Hands-free operation for increased visual focus. Single tap adjusts treatment power settings quickly and easily.

Clinical Case Analysis: Fluid Management & RPE Stimulation

The application of SP-Mode[®] has fundamentally changed fluid management in retinal practice. By stimulating the RPE without causing thermal damage, clinicians can now address pathologies previously deemed too delicate for laser intervention.

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Case A: Post-Surgical Residual Fluid (Bullous Retinal Detachment)

Feature	Clinical Benefit
Clinical Presentation	A young patient with an inferior bullous retinal detachment and inferior hole. Following successful retinal buckling surgery and fluid drainage, significant residual fluid persisted 15 days post-operatively despite confirmed hole closure.
Treatment Strategy	SP-Mode® applied in a grid pattern over the inferior retina to stimulate RPE-mediated fluid clearance.
Observed Outcome	Rapid reabsorption. Within 30 days, the retina was completely reattached with no residual fluid.

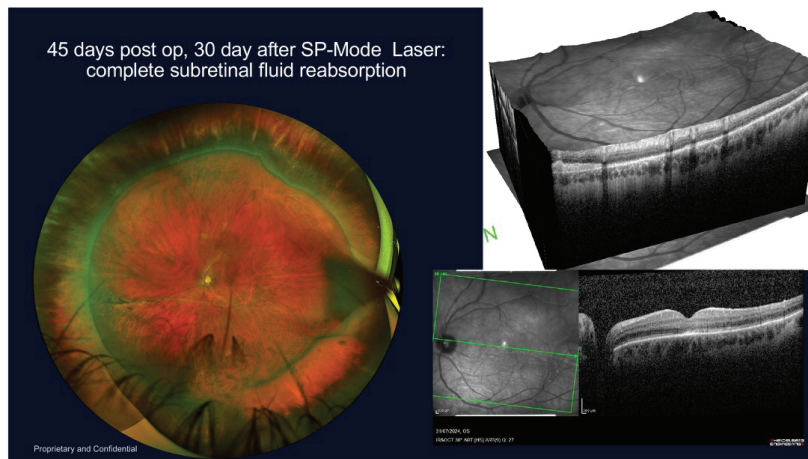


Figure 4: Case A outcome, 45 days post-op (30 days after SP-Mode®): complete subretinal fluid reabsorption confirmed by widefield and OCT imaging.

Case B: Central Serous Chorioretinopathy (CSCR)

Feature	Clinical Benefit
Clinical Presentation	Classic CSCR with a clear point of leakage identified via fluorescein angiography.
Treatment Strategy	Dual-action approach: single-spot laser applied to the leakage point, followed by SP-Mode® over a large confluent central area.
Observed Outcome	Consistent fluid reduction observed by day 20, with complete resolution by two months.

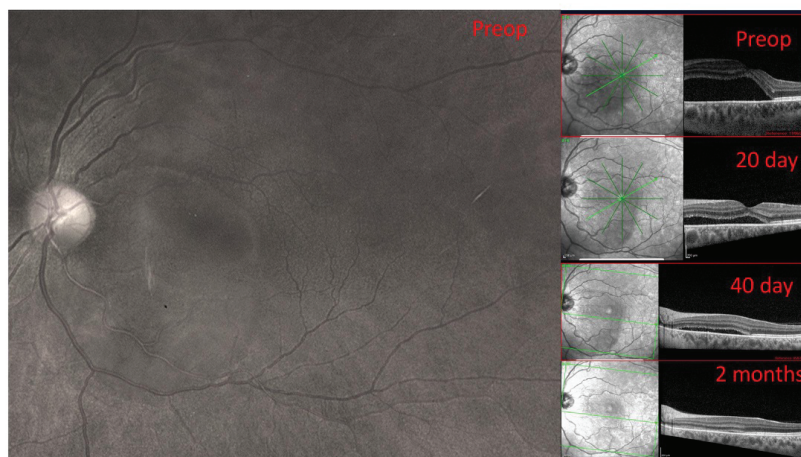


Figure 5: Case B CSCR progression: preoperative through 2-month follow-up showing consistent fluid reduction and complete resolution on OCT.

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Case C: Drusenoid Detachment and Dry AMD

Feature	Clinical Benefit
Clinical Presentation	Drusenoid detachment remaining after resolution of neovascularization, previously treated with anti-VEGF therapy.
Treatment Strategy	SP-Mode® used to stimulate RPE activity in the macula.
Observed Outcome	Marked reduction in metamorphopsia and visible promotion of drusen reabsorption within one month.

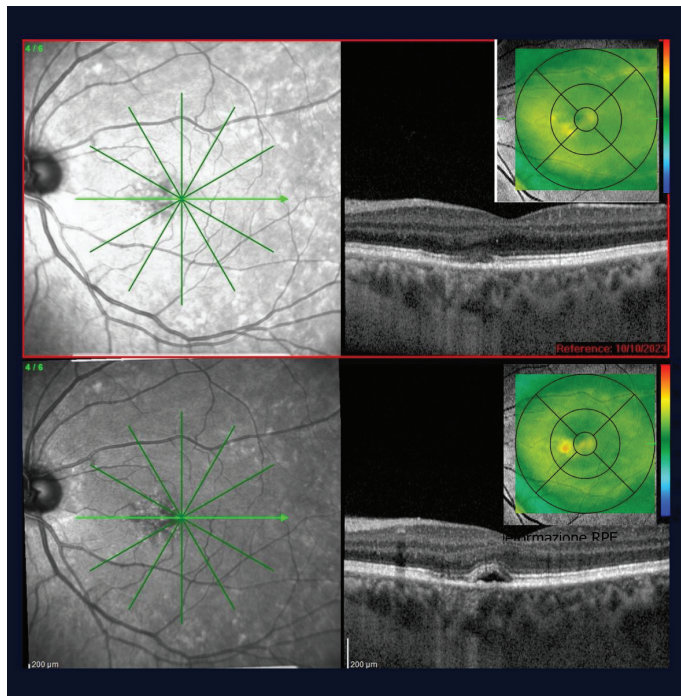


Figure 6. Case C drusenoid detachment, SP-Mode® treatment results showing marked RPE improvement and metamorphopsia reduction.

Case D: Persistent Irvine-Gass Syndrome

Feature	Clinical Benefit
Clinical Presentation	Post-cataract macular edema in a high myope, resistant to NSAID drops for several months.
Treatment Strategy	Single session of SP-Mode® to address underlying RPE decompensation.
Observed Outcome	Complete resolution of fluid that has remained stable for years following a single treatment session.

Case E: Refractory Macular Edema (Retinal Vein Occlusion)

Feature	Clinical Benefit
Clinical Presentation	Patients receiving extensive anti-VEGF injection series with persistent edema or treatment resistance.
Treatment Strategy	SP-Mode® applied in five grids (7×7) over the macular area.
Observed Outcome	Complete resolution. This approach eliminates repeated injection costs and reduces cumulative infection risk associated with multiple intraocular entries.

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Recommended SP-Mode® Treatment Parameters

Parameter	Setting	Notes
Wavelength	577nm (Yellow)	Optimal RPE selectivity
Mode	SP-Mode®	5% duty cycle sub-threshold
Duty Cycle	5%	Prevents thermal tissue damage
Pattern	Grid (e.g., 7×7)	Adapt grid size to pathology area
Clinical Goal	RPE Stimulation	Stimulation, not ablation

Deliver high-density SP-Mode® Microsecond Laser Technology in a confluent, no-spacing “painting” pattern, repeatedly covering the entire edema area to achieve up to 500 SP-Mode® applications.

Summary: The Power of Effective Design

The effectiveness of a medical device is not measured by its complexity, but by its ability to complement the surgeon’s skill. The TruScan Pro embodies this philosophy, delivering high-performance results through elegant, effective design.

By utilizing the 5% duty cycle SP-Mode® technology with the 577nm yellow wavelength, the TruScan Pro has modernized retinal practice: enabling safe foveal treatment, managing refractory cases that once required repeated injections, and consolidating multiple treatment capabilities into a single, cost-effective platform. **The TruScan Pro remains an essential instrument for the modern retinal specialist.**

About the Author

Dr. Miguel Rechichi is a comprehensive eye surgeon and the Founder and CEO of Centro Polispecialistico Mediterraneo, a surgical clinic in Sellia Marina, Italy, equipped with state-of-the-art ophthalmic technology.

He completed his training in ophthalmology and PhD at Magna Graecia University in Catanzaro, Italy, and obtained the Diploma of Specialist Superior in Ophthalmology (DISSO) from the University of Lugano, Switzerland. He currently serves as a Visiting Professor at the University of Minnesota.

Dr. Rechichi is recognized as a pioneer in accelerated crosslinking clinical application and is actively involved in developing new accelerated and combined CXL protocols. He is regularly invited as a Key Opinion Leader to ophthalmic meetings worldwide.

He has published extensively in reputed peer-reviewed journals and serves as an editorial board member of several ophthalmic publications.

Disclaimer: Clinical outcomes described in this document reflect individual practitioner experience and may vary. The TruScan Pro is a Class 4 laser device intended for use by qualified ophthalmic professionals. Always refer to the operator’s manual for complete safety guidelines and contraindications.