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Enhanced Photo-Sono Therapy With Dual-Frequency Ultrasound

Tech ID: 34691 / UC Case 2026-543-0

BRIEF DESCRIPTION

A novel non-invasive therapy combining pulsed laser and dual-frequency ultrasound for rapid and precise treatment of port-wine stains.

FULL DESCRIPTION

This innovative therapeutic system enhances anti-vascular treatment by integrating pulsed laser irradiation with dual-frequency ultrasound sonication. It lowers cavitation thresholds and broadens frequency spectrum, enabling faster treatment with lower energy and acoustic power while minimizing damage to surrounding tissue. The system also synchronizes laser and ultrasound delivery and can be integrated with real-time imaging modalities like optical coherence tomography (OCT) and photoacoustic imaging (PI) for guided therapy. Beyond port-wine stain treatment, this method shows potential for managing neovascular ocular diseases and thrombolytic interventions.

SUGGESTED USES

- » Treatment of capillary malformations such as port-wine stains (PWS).
- » Management of neovascularization-related ocular diseases including diabetic retinopathy and age-related macular degeneration.
- » Thrombolytic therapy for venous thrombosis and arterial plaque removal.
- » Integration in clinical therapeutic settings requiring non-invasive vascular lesion removal.

ADVANTAGES

- » Faster treatment times, shortening therapy from minutes to seconds per treatment site.
- » About tenfold lower laser pulse energy requirements than previous methods.
- » Reduced ultrasound power requirements by approximately 40%.
- » High spatial precision via laser focus modulation.
- » Real-time treatment monitoring and guidance via integration with medical imaging systems.
- » Improved treatment efficacy with dual-frequency ultrasound.
- » Minimizes collateral thermal and mechanical tissue damage.

PATENT STATUS

Patent Pending

CONTACT

Alvin Viray
aviray@uci.edu
tel: 949-824-3104.



OTHER INFORMATION

CATEGORIZED AS

- » **Imaging**
 - » Medical
- » **Medical**
 - » Disease: Cardiovascular and Circulatory System
 - » Disease: Dermatology
 - » Imaging
 - » Therapeutics
- » **Sensors & Instrumentation**
 - » Medical

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