

Corporate Review

OPUSMED

LUMIPHASE-R OPTICAL POSITIONING AND HIGH-POWER DENSITY: TAKING LED TECHNOLOGY INTO SECOND GENERATION MODE

By Rosemary Clandos

At the American Academy of Dermatology Conference in early February, OPUSMED Inc. presented an innovative and clinically demonstrated light-emitting diode (LED) device to stimulate collagen production and improve overall skin appearance.

The LumiPhase-R delivers exact dosing of photons at a precise working distance from the skin and takes LED technology into second-generation mode. Still awaiting FDA clearance, the LumiPhase system will eventually be used to treat various skin conditions, such as acne.

A recent study involving 53 photoaged patients showed an average of 58% improvement in skin roughness and wrinkle depth. A previous *in vitro* study also showed an average increase of 39% in collagen production and a 29% decrease in collagenase (MMP-1). As part of the normal aging process, collagen decreases and collagenase secretion increases.

"With our treatment, we are able to reverse this ratio," says Daniel Barolet, a Dermatologist who founded the company in 1997 and designed the LumiPhase technology. Dr. Barolet conducted the research at the Derma-Laser, Inc. Research Division in Montreal.

"Unlike laser devices, LumiPhase-R induces no thermal damage and prevents heat-related side effects," says Dr. Barolet. "Although other LED devices have been on the market, they do not bear the LumiPhase-R energy delivering and focusing features," he adds.

LumiPhase-R possesses a unique optical positioning system which detects distance and enables perfect matching of four aiming beams. It allows for better beam intensity and delivery over the skin surface.

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"We have remarkably high precision. The optical working distance is accurate to plus or minus 3 millimeters," says Dr. Barolet. "Other devices don't seem to have such a gauge or definite working distance."

"We are enhancing the potentials of LED science even further with our specially configured chip-on-board LED technology, to achieve excellent beam uniformity to the treated area," says Dr. Barolet.

To stimulate cells more effectively, the device has high-power density which enables uniform, pulsed delivery of photons in a short treatment time within the limit of a non-thermal treatment. "To be effective, you have to pulse the light source. Using a continuous wave, you do not enhance collagen production as much," according to Dr. Barolet. Sequential pulsing aims to prevent exhaustion of the fibroblasts.

In addition, the high-intensity pulsing and short treatment time seem to play a role in a process which OPUSMED calls photoinduction. During photoinduction, a series of sub-cellular enzymatic reactions are triggered and energize fibroblasts to increase collagen production. Light energy is absorbed by enzymes located in the mitochondria, the cell's energy unit, and a cascade of photobiochemical reactions induces protein synthesis.

"Signal transduction and amplification favors production of new collagen in the dermis," says Dr. Barolet. "The use of a well-absorbed wavelength, 660nm, which reaches the deepest possible layers of the fibroblasts in the dermis, is another contributing factor to the success of this new skin rejuvenation treatment."

For optimal skin improvements, patients require 12 treatments, two per week for six weeks. After cleansing the area to remove possible obstructions to light energy and making adjustments to the optical positioning system, the treatment takes about two minutes. Yearly maintenance treatments are suggested.

Dr. Barolet adds that topical rejuvenation products containing active ingredients such as antioxidants can enhance the treatment benefits of LumiPhase-R therapy.

OPUSMED is currently investigating the technology's application for inflammatory acne, vitiligo, dilated pores, and stretch marks. Cosmetic photodynamic therapy using the Lumiphase system and topical 5-ALA also seems very promising, says Dr. Barolet.

Officials at OPUSMED expect LumiPhase-R to be on the market by fall 2004. The acne-treating device, LumiPhase-B, should be out by the beginning of 2005. The company has five patents pending on the technology.



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