

OPUSMED Explores Science Behind LED Efficacy

By Bob Kronemyer, Associate Editor

Both in-vitro and in-vivo testing have validated the cutting edge technology of a new light-emitting diode (LED) device for skin rejuvenation from OPUSMED Inc. (Montreal, Canada). The LumiPhase-R combines high-power density and optical positioning, for faster and more efficacious treatment, according to the developer.

“We are now part of this exciting post selective photothermolysis era where you can actually influence complex subcellular enzymatic reactions favorably with the help of specially configured LED photons so as to obtain excellent clinical results” said Daniel Barolet, M.D., a dermatologist who founded the company. LumiPhase-R’s proprietary sequential pulsing pattern is delivered through 18 high performance LED modules with exceptional beam uniformity. “Two specific advantages of new LEDs compared to low-level lasers are the ability to treat larger surfaces and a greater clinical response via a unique sequential pulsing pattern,” Dr. Barolet pointed out.

“There is a chain of molecular events starting with the absorption of light by a photoreceptor,

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which leads to signal transduction and amplification, ending in a photoresponse,” Dr. Barolet explained. “We are beyond the concept of thermal injury, with clinical results superior to current non-ablative thermal technologies.”

In early 2000, multiple modes (wavelength, pulsing patterns, irradiance, etc.) were tested on monolayers of fibroblasts. “We wanted to determine the most efficacious modes to be tested on cultured skin equivalents, both epidermis and dermis,” Dr. Barolet said. The company’s laboratory research team conducted several studies using



ELISA dosage for procollagen and metalloproteinases (MMPs), as well as histopathology and immunohistochemical analysis. “We were able to demonstrate that optimal parameters could trigger an average procollagen secretion increase of 39% versus control, on our oldest cell line,” Dr. Barolet reported.

Further in-vitro studies allowed OPUSMED to identify the most promising final sequential pulsing modes for subsequent in-vivo testing. A split-face study of 53 photoaged subjects found 58% improvement in skin roughness and depth of rhytides using PRIMOS digital profilometry measurements. In the study, patients were treated three times a week for four weeks. “These patients were exposed to LED light for only a few minutes during each session, with no discomfort or burning sensation,” Dr. Barolet said. Significant improvements in skin tone, texture, pore size, dyspigmentation and erythema were also noted.

LumiPhase-R’s high-power density maximizes new collagen deposition by dermal fibroblasts. “You also want to ensure that the right amount of photons reach the target cells through optimal and uniform beam delivery over the skin surface,” said Dr. Barolet. “Our optical positioning system allows us to deliver the exact amount of energy needed to energize the fibroblasts in order to produce more collagen.” ■