

1. J Cosmet Dermatol. 2006 Mar;5(1):87-91.

# Phototherapy in anti-aging and its photobiologic basics: a new approach to skin rejuvenation.

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## Abstract

Intrinsic aging and photoaging of the face are constantly ongoing, and eventually result in the typical "aged" face, with visible lines and wrinkles at rest, a variety of dyschromia and a tired, dull and lax epidermis over poorly organized elastotic dermal architecture characterized by many interfibrillary spaces. Both ablative and nonablative resurfacing have been reported as solutions, the former providing excellent results, but a long patient downtime, and the latter giving little or no downtime, but less-than-ideal results. In ablative resurfacing, the epidermis is removed and replaced with a "new" epidermis, whereas in the nonablative approach the epidermis is spared through some form of cooling. In both approaches, however, the goal is to create controlled amounts of thermal damage in the dermis to stimulate the wound healing process, thus generating a tighter, better organized, "younger" dermal matrix. A better approach might be to apply prevention, rather than the cure, and to treat subjects in their very early 20s, before even fine lines have begun to appear. This "photoanti-aging" approach could be achieved with the use of very low incident levels of photon energy to stimulate the skin cells, both epidermal and dermal, at cell-specific wavelengths based on the photobiological findings of the literature over the past two decades or so, in order to increase their resistance to the effects of chronological and photoaging. Lasers and IPL systems could be used, but are extremely expensive and therapist-intensive. A new generation of light-emitting diodes (LEDs) has appeared as the result of a spin-off from the US NASA Space Medicine Program, which are much more powerful than the previous generation with quasimonochromatic outputs. These LEDs can offer target specificity to achieve photobiomodulated enhanced action potentials of the skin cells, in particular mast cells, macrophages, endotheliocytes, and fibroblasts, plus increases in local blood and lymphatic flow, in a noninvasive, athermal manner. New phototherapeutic LED-based systems have appeared to meet the need for a less-expensive but clinically useful light source to enable photoantiaging as a reality in clinical practice. Some studies proving the efficacy of LED therapy have already appeared, and based on their results LED therapy represents a potential new approach to prevention in anti-aging, so that further studies are warranted to prove its efficacy.