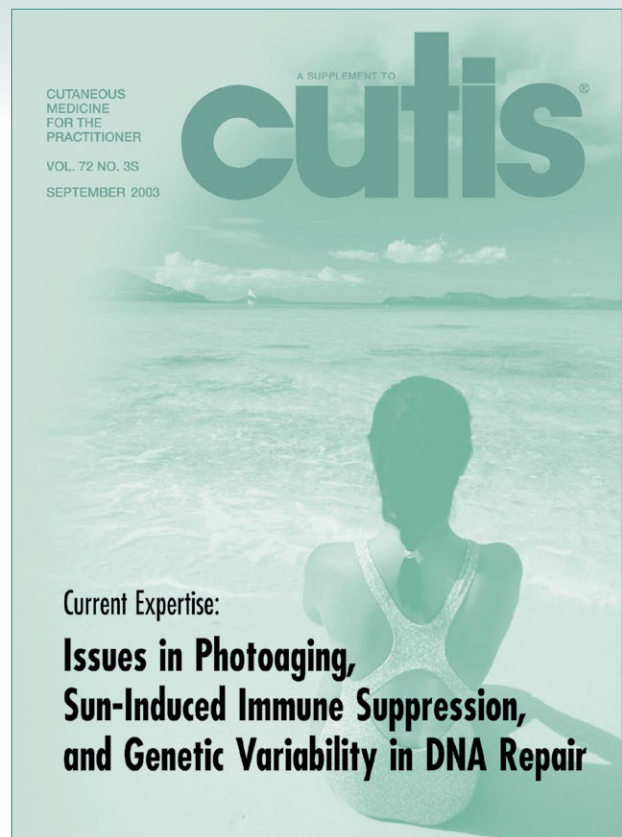


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Current Expertise: Issues in Photoaging, Sun-Induced Immune Suppression, and Genetic Variability in DNA Repair

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Presented at the First Annual Dermatology Update, "New Insights Into Skin Aging, Sun-Induced Immune Suppression, and the Genetics of DNA Repair," on Saturday, April 12, 2003, at Beth Israel Medical Center, New York, New York.

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In developed countries, interest in cutaneous aging is in large part the result of a progressive, dramatic rise over the past century in the absolute number and proportion of the population who are elderly. The psychosocial, as well as physiologic, effects of skin aging on older persons have created a demand for a better understanding of the aging process and particularly for effective interventions. Skin aging is a complex process determined by the genetic endowment of the individual and by environmental factors. The appearance of old skin and the clinical consequences of skin aging have been well-known for centuries, but it is only in the past 50 years that mechanisms and mediators have been pursued

systematically. Still, within a relatively short time, there has been tremendous progress, a progress greatly enhanced by basic gerontologic research using immunologic, biochemical, and in particular, molecular biologic approaches.

Implications of UV-Induced Inflammation and Immunomodulation

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Kevin D. Cooper, MD; Elma D. Baron, MD; Mary S. Matsui, PhD

Sunscreens are the most effective and widely available interventions for sun damage, other than sun avoidance or clothing. However, sunscreens vary widely in their ability to screen various UV wavelength components. Testing methods for sunscreens rely on UV-induced erythema to determine a sun protection factor (SPF), primarily a measure of UVB protection only. Determination of an immune protection factor (IPF) has been proposed as an alternative or adjunctive measure to SPF, and, indeed, recent studies show that the IPF can detect the added in vivo functionality of sunscreens—such as high levels of UVA protection—that the SPF cannot. Consensus on the definition of IPF, however, is required. Data are available on quantification of the IPF for restoring the afferent or induction arm of contact sensitivity, but other immune parameters also have been measured. A review of in vivo studies in humans, in which sunscreens are used to intervene in UV-induced modulation of immune response, cells, or cytokines, highlights the technical variables and statistical approaches that must be standardized in the context of an IPF for regulatory product claim purposes. Development of such IPF standards would allow the integration of both UVB and non-UVB solar wave-band effect-reversals. In addition, it could be applied to integrate the effects of other ingredients with protective function (ie, antioxidants, retinoids, or other novel products) and spur the development of more advanced and complete protection products.

Medical Implications of DNA Repair

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Daniel B. Yarosh, PhD

When the sun damages the skin, it also impairs the DNA. The DNA repair system is needed to maintain the genetic integrity of the epidermis. Defects in DNA repair (eg, xeroderma pigmentosum) commonly result in skin cancer. Sunscreens are important for preventing sun damage, but inadequate application by consumers is common, and protection against DNA damage is incomplete. The human population varies widely in its formation and response to DNA damage. Sequencing of individuals' DNA repair genes has revealed unexpected diversity, and some polymorphisms may be related to skin cancer risk. DNA damage has been linked to immune suppression in humans, and variations in this immune response also are linked to cancer risk.