48 Genetic Alterations and Skin Cancer Development after UV Radiation
A Pacilio
S Gallicano Institute, IRCCS, Rome, Italy
Ultraviolet (UV) radiation present in sunlight causes DNA damage, inflammation, erythema, sunburn, immunosuppression, photocaging, gene mutations and skin cancer. Several studies indicate that genetic alterations in the p53 tumor suppressor gene play an important role in the development of skin cancer. The p53 protein is also involved in programmed cell death and it has been proposed that p53 serves as a "guardian of the genome" by aiding DNA repair or causing elimination of cells with excessive DNA damage. Chronic UV exposure, overwhelms DNA repair mechanisms leading to induction of p53 mutations. Keratinocytes carrying p53 mutations acquire a growth advantage by virtue of their increased resistance to apoptosis and resistance to cell death is a key event in photocarcinogenesis. Apoptosis-resistant keratinocytes undergo clonal expansion that may lead to formation of actinic keratoses and squamous cell carcinomas. Because UV-induced p53 mutations arise early during the development of skin cancer, discontinuation of UV treatment can still result in skin tumor development, although the kinetics of tumor occurrence is delayed in the latter case. In conclusion, cancer development can be delayed but not abrogated upon further avoidance of exposure to UV radiation.

49 Topical DNA Repair Enzymes: A Novel Approach to Photoprotection
P Wolf
Research Unit for Photodermatology, Department of Dermatology, Medical University Graz, Austria
Conventional sunscreens protect by the incorporation of chemical and/or physical UV filters from the harmful effects of UV radiation. A novel approach to photoprotection is the topical application of liposomal encorporated DNA repair enzymes engineered to increase DNA repair after UV exposure. Clinical studies revealed that liposomes with DNA repair enzymes applied topically after UV exposure penetrated human skin, delivered enzyme to keratinocytes and epidermal Langerhans cells, prevented UV-induced upregulation of the immunosuppressive cytokines interleukin-10 and tumor necrosis factor-alpha and exhibited immunoprotective capacity under circumstances in which the UV-induced erythema response remained unaffected. Clinical phase III testing in a multicenter, placebo-controlled study revealed that the regular topical administration of liposomes containing the repair enzyme T4 endonuclease V significantly reduced the incidence of actinic keratoses and basal cell carcinoma in the human skin cancer model disease xeroderma pigmentosum. DNA repair enzyme-containing liposomes offer a new avenue for photoprotection since they are effective even when applied after initiation of a sunburn reaction. The strategy is currently in clinical phase II testing for the reduction of skin cancer in organ transplant patients and in subjects with a history of actinic keratoses and/or skin cancer. Purified DNA repair enzymes such as photolyase and/or micrococcus luteus extract are formulated into cosmetic sun care preparations and already marketed in after sun lotions or sunscreens together with UV filters.

50 Better Sunscreen or Better Sunscreen Use?
J Grob
Department of Dermatology, Marseille, France
The problem of protection by sunscreens (SCs) is no longer a technical one. New SCs used in Europe cover the full UV spectrum. The residual problems are photoinstability, penetration, and protection against infra-erythemal effects. Under ideal trial conditions SCs can reduce the development of precancerous solar keratoses, the recurrence of squamous-cell carcinoma and the development of nevi in children. Most of the attention is focused on the chemical and physical properties of SCs, although 90% of the protection by SCs depends on the way they are used. Indeed, a decrease in the SC thickness results in a much higher decrease in the effective protection. In real life, SCs are used at a much lower quantity per surface than the amount used by manufacturers to assess the SPF, are often not adapted to individual skin type and situation, and are neither applied at a sufficient frequency, nor in an homogeneous way. Among the multiple factors which can influence SC use and lead to an insufficient protection, the most important are: 1- motivations to use SCs which are not always targeted at protection and no effort is done to explain the ambiguity between protection and tanning to consumers, 2- the high cost of SCs preventing a frequent use, 3- the cosmetics properties of SCs preventing a more than 1/2 to 1/3 mg/cm² application in the everyday life, 4- the fact that sun protection factor (SPF) for UVB and UVA, is not understandable by most users, and that SPF calculated with 2 mg/cm² must be translated into the real protection obtained with 1/2 to 1/3 mg/cm², 5- the fact that the labelling suggests protection without mentioning the quantity of SCs and frequency of application required to have this expected protective effect, 6- the fact that the legal mentions on the bottles and packaging do not inform about the factors which account for the practical choice by any consumer, i.e ability to protect from sunburn, likely protection against long-term effects of the sun exposure (skin ageing and cancers), and possibility to get a tan. Interventions on cost, labelling, and cosmetics of SCs, could improve protection much more than technical improvements of SCs, at least in those who really want to be protected.

51 Prevention of Solar Damages by Personalized UV Teledosimetry and Mobile Phone
G Monfrecola and G Fabbrocini
Dept of Systematic Pathology, Section of Dermatology, University “Federico II”, Naples, Italy
Clinical and experimental studies have shown that chronic and prolonged sun exposure has a major role in the pathogenesis of epithelial skin cancer, while intermittent sun exposure has a somewhat controversial role in the pathogenesis and progression of melanoma. Many authors stress the importance of prevention in reducing sunburn risk. Public education programs in Australia and Sweden have produced substantial changes in people knowledge, attitude and perceptions about melanoma, non-melanoma skin cancer, sunlight, sunbeds and suntanning. Such effects could be different according to the solar anamnesis (skin type), time and ways of sun exposure. The purpose of this study was to obtain a personalized UV dosimetry and by the use of mobile phone improve the preventive devices among population. The project was carried out with the financial support of the Regione Campania (Italy), and scientific support of Department of Dermatology, University “Federico II” of Naples (Italy). In a central Mediterranean area (the town of Capri, 41° 15’ North) from August trough September 2003 an experimental photobiology system was set up. By a UV monitoring device it has been possible to calculate the current UV Index, the minimal individual erythema dose (MED) and, by a computerized software performed, the time of exposure to avoid sunburn for each patient. This information was automatically delivered on mobile phone of guests examined. By their mobile phone the guests registered can send messages SMS to how some information about UV values and time of exposure day by day. 280 tourists registered at photoprotection center in Capri. 75% were females and 25% were males. The mean age was 38 ± 5.4. About 1000 SMS were delivered on mobile phone of tourists registered to give information about sun protection factor and UV Index. The development of this experimental set-up can help dermatologists to improve UV exposure and can represent a new device of prevention among population. The simplicity and the reliability of this experimental UV dosimetry system could play an important role in the prevention of damages from sun exposure.

www.jidonline.org