Out of Africa

In a study of the largest reported xeroderma pigmentosum (XP) cohort from Maghreb in North Africa, Soufir and colleagues identified XPC or XPA mutations in 85 and 12% of patients, respectively. One particular frameshift mutation (c.1643_1644delTG) was identified in the homozygous state in 87% of XP-C subgroup patients. Analysis of this mutation revealed a common founder effect in the Mediterranean region, which probably occurred 1,250 years ago. The high frequency of the identified mutations suggests that patients from North Africa be tested for these mutations to protect them from an early age against sun-damaging effects and skin cancers associated with this defective DNA repair disease. See page 1537

Repetitive Rays

UV radiation affects pigmentation in human skin, although different wavelengths induce distinct responses. Choi and colleagues examined gene expression patterns in skin in situ following repetitive exposure to different types of UV (UVA and/or UVB) using whole-genome microarray data. Interestingly, the majority of UV-responsive genes were involved in regulating skin pigmentation. Although both sources of UV were capable of producing skin tanning after repeated exposure, UVB strongly stimulated melanogenesis-related genes, whereas UVA elicited no similar increase in these factors. Tanning following long-term UVA exposure probably results from changes in preexisting melanin or melanin intermediates, indicating that skin cells respond distinctly at the molecular level, depending on the wavelengths of UV radiation. See page 1685

New EB Mutation

Mutations in thirteen genes that encode eleven structural proteins have been identified as the cause of epidermolysis bullosa (EB), a group of inherited blistering skin disorders. Groves and colleagues identified a novel homozygous nonsense mutation in the dystonin gene (DST) coiled-coil domain, which is included in the epithelial form of bullous pemphigoid antigen 1 (BPAG1-e), in a patient with a history of blisters and some neurological symptoms. These findings demonstrated a specific, but comparatively minor, role for BPAG1-e in the structural organization of hemidesmosomes in vivo. See page 1551

Infrared Leaves Its Mark

Human skin is the primary target for solar radiation, which is composed of UV and IR radiation. One-third of the solar energy load of the skin comes from near-IR radiation (IRA), which invokes premature skin aging. In a study of the IRA-induced transcriptome in primary human skin fibroblasts, Calles and colleagues discovered 599 transcriptionally altered genes involved in extracellular matrix metabolism, calcium ion homeostasis, stress signaling, and apoptosis regulation. Thus, IRA evokes a unique signaling response, suggesting that protection against IRA requires unique strategies currently absent from sunscreens. See page 1524

Pinpointing the Wavelength

By examining the contact hypersensitivity response in subjects with nickel allergies, Matthews and colleagues determined that shorter UVB wavelengths (290–310 nm) were highly immunosuppressive, whereas longer wavelengths (322 nm) exerted no effects. In the context of relative sunlight exposure, the authors assert that 310-nm UVB rays probably have the greatest impact on immunosuppression. This UVB peak mirrors the UVB action spectrum for formation of pyrimidine dimers and approximates that of cis-uronic acid, implicating these specific rays in both UVR-induced skin carcinogenesis and immune suppression, which may help tumors to evade surveillance and rejection. See page 1680