



# Non-Ionizing Radiation & Children's Health

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## PLATFORM PRESENTATION

### Skin Cancer - Primary And Secondary Prevention (Information Campaigns And Screening) - With A Focus On Children & Sunbeds

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Skin cancer is the most frequent cancer in the white population worldwide. Incidences of basal cell carcinoma (BCC), squamous cell carcinoma (SCC) and malignant melanoma (MM) are rapidly increasing during the last decades. The main risk factor for skin cancer induction is known: UV radiation from natural and artificial sources. This has been proven by overwhelming evidence from experimental in-vitro and in-vivo data in UV-biology and epidemiological studies. It is clear now that natural and artificial UVB (280 -315 nm) and UVA (315 -400nm) introduce specific signature mutations as well as epigenetic alterations which are responsible for skin cancer induction. These results have been taken as the scientific basis for information campaigns in primary prevention for specific age groups and also for the design and implementation of skin cancer screening campaigns (secondary prevention). The worldwide biggest skin cancer screening has been tested and finally introduced in Germany. First results show that this kind of screening is able to increase the number of early detected melanoma and to decrease melanoma mortality rate already 5-6 years after introduction of the screening.

Migrant studies, studies on anatomic distribution of nevi and of melanoma, studies on melanoma occurrence according to sun exposure in childhood and adulthood strongly indicate that key UV-induced biological events for melanoma occurrence and death in adult life take place during childhood. If melanocytes in adults were not UV-initiated during early childhood, sun exposure could still induce nevus formation or non life-threatening melanoma (i.e., in situ melanoma or thin indolent melanoma), but no longer melanoma that could be life threatening. Studies on nevi in children further suggest the existence of site-specific biological pathways that combine their effects with sex-specific biological events. The trunk for instance, would be most susceptible to UV carcinogenic effects. This evidence of childhood UV-exposure for melanoma occurrence in adult life has consequences for the appraisal of the impact of UV therapy of children in the first half of the twentieth century, that was promoted for combating ill-health and vitamin D deficiency. It also underlines the threat represented by sunbed use starting during adolescence. The most recent update of the meta-analysis of eleven studies found that sunbed use starting before 30 years of age is associated with a 2-fold increased risk of melanoma. The greater susceptibility of children to UV radiation correlates well with animal experiments that demonstrated the possibility to obtain UV-induced melanocytic lesions in young suckling rodents, but not in older rodents.