Seminar der GD Task Force „Licht.Hautkrebs.Prävention“: Heller Hautkrebs - Update 2014

Prevention of Skin Cancer

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Skin cancer chemoprevention is defined as the application of natural or synthetic substances to prevent, reverse, or suppress cutaneous tumor growth. Knowledge of carcinogenesis as a chronic multi-stage continuum affords multiple potential targets for intervention in the malignant process based upon the recognition that neoplastic growth is dependent on sequential eventsthat have been identified largely through studies in animal models of skin tumorigenesis. These stages include: 1) tumor initiation; 2) tumor promotion, and 3) malignant progression of cancer. Exposure of the skin to solar UV radiation simultaneously drives a broad array of pro-inflammatorysignaling pathways, promotes oxidative stress, structurally alters DNA leading to mutagenesis, and has immunosuppressive effects all of which to varying degrees contribute to the growth of skin cancers. An ideal chemopreventive agent for human use should possess to the extent possible the following properties: (i) limited or manageable toxicity, (ii) anti-mutagenicityandanti-carcinogenicity, (iii) selective targeting of cellulareventsbased on mechanism-driven effects, (iv) efficient absorption and distributionin relevant tissue sites, (v) affordability,and(vi) human acceptability. Our approach to identifying potential chemopreventive agents has been to screen compounds for biologic activity in relevant cancer cell lines and then to proceed to mouse models genetically engineered to heighten their susceptibility to carcinogenic agents and finally to conduct clinical trials in relevant human populations. Numerous types of both natural and synthetic cancer chemopreventive agents have been proposed but no approaches have yet emerged that meet all of the ideal characteristics described above. Ongoing research has the potential to address these current limitations.