Synopsis of Original Research Paper

# Gene mutations induced by UVA, B light in human skin maintained in severe combined immunodeficient mice

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To study the mechanism and risk of human skin cancer from solar light, we exposed human skin transplanted to severe combined immunodeficient mice to daily doses of UVA and UVB (dose rate of 2.8 J/m2/sec) for period of approximately 2 years and investigated morphological and genetic changes of human skin tissues. Of 18 normal skins, 14 actinic keratoses (77.8%) and 4 skin cancers (3 squamous cell carcinomas and 1 undifferentiated carcinoma) developed, wheras neither actinic keratosis nor cancer was observed in 15 human skins not exposed to UVA and B. This is the first success in inducing cancer and solar (actinic) keratosis in human skin by UVA , B. Among p53 mutations at various sites, mutation at codon 242 (cTGC→cCGC; Cys→Arg) was specifically observed in both skin cancers and actinic keratoses. Furthermore, double or triple mutations were induced in all UVA , B-induced skin cancers and in three of eight actinic keratoses. As well as p53 mutations, 2 of 3 squamous cell carcinomas had also K-ras and c-kit mutations. So far as we know, c-kit mutation has not been reported in the skin cancer except melanoma. Mutations of β-catenin gene occurred in 7 human skins, but these were non- specific mutations.