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THE EFFECT OF UVB RADIATION ON THE EXPRESSION OF *SOX2* AND *SOX9* GENES IN HUMAN KERATINOCYTES *IN VITRO*

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Introduction: Prolonged exposure to sunlight, has a harmful effect on skin cells encompassing reduced viability, morphological changes, and altered gene expression. The two most prevalent types of skin cancer, squamous cell carcinoma (cSCC) and basal cell carcinoma (BCC), arise from malignant transformation of keratinocytes. UV radiation, among other factors, serves as the primary cause of these tumors. Previous data has shown that changes in different *SOX* genes expression in these cancer types correlates with disease progression, suggesting their role as oncogenes/tumor suppressors. The presented work is focused on examining the impact of UVB radiation on the expression of *SOX2* and *SOX9* genes in HaCaT cells derived from human keratinocytes.

Methods: Using a custom-made UV solar simulator for the irradiation of HaCaT cells with 150 mJ/cm^2 or 300 mJ/cm^2, we analyzed *SOX2* and *SOX9* gene expression. In order to determine the protective effects of quercetin, anti-inflammatory bioflavonoid, we treated irradiated HaCaT with quercetin, and analyzed *SOX* gene expression.

Results: Our results indicate that UVB radiation induces a dose dependent decrease of *SOX2* expression while expression of *SOX9* was increased at the dose of 150 mJ/cm^2 in HaCaT. Treatment of cells with quercetin increased the expression of both *SOX2* and *SOX9* genes in HaCaT cells following UVB radiation at both doses compared to irradiated cells.

Conclusions: Further research is needed to understand the molecular mechanisms and significance of *SOX2* and *SOX9* in UVB-induced cellular responses, in the context of nonmelanoma cancers with potential implications for targeted therapeutic strategies for nonmelanoma cancers.

Keywords: UVB; *SOX2; SOX9;* HaCaT cells.

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