ABSTRACT

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Title of diploma thesis: Modulation of GRKs and beta-arrestins expression by UVB in keratinocyte cell line HaCaT and in epidermis

GPCRs are types of receptors that are used for the transmission and communication between cells. GRKs and β-arrestins are specific proteins, which cause desensitization of GPCR and influence the transmission of signals to the final effecter cells. Recently, it was found out, that these specific proteins can also influence cell migration and play a role in carcinogenesis and UV induced cell death.

These types of GPCRs are also observed in skin. The skin introduces a protective shield against UV. UV light has strong genotoxic effects like DNA damage, mutation induction and, in the worst case, causes the growth of tumours.

The aim of our work was to determine the influence of UVB radiation on GRKs and β-arrestin gene expression in HaCaT cell lines in vitro and in human epidermis in vivo. We also made efforts to compare different types of preparation of epidermis samples.

For this work we used SDS-PAGE, Western blot, Coomassie blue staining and qPCR. We also used the MTT test for determination of viability on HaCaT cells line.

On protein level our results showed increasing expression of GRK2 in HaCaT cell lines after UVB irradiation. To the contrary on the mRNA level we investigated the up-regulation of expression of GRK5 and down-regulation of β-arrestin 1.

On the mRNA level, results with epidermis after UVB irradiation showed an up-regulation expression of GRK7 and a down-regulation of β-arrestin 2. Our results with epidermis samples preparation demonstrated that samples with Fresh epidermis (fresh skin) are the most suitable.