Synopsis of Original Research Paper

# The study on immune reaction and stress response in cytokine knockout mouse skin.

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The induction of contact sensitization is associated with the movement of epidermal Langerhans cells (LC) from the skin and their migration to draining lymph nodes where they accumulate as immunostimulatory dendritic cells (DC). It has been reported that interleukin-1β (IL-1β) and tumor necrosis factor α (TNFα) are key cytokines for LC migration and/or maturation. This study has determined the effect of 2,4,6-trinitrochlorbenzene (TNCB) on contact sensitization in IL-1α/βgene deficient (IL-1KO) and TNFαdeficient (TNFαKO) mice. IL-1KO mice showed weak ear swelling response (about 85% of wild). LC existed in IL-1KO epidermis appeared to be morphologicaly similar to that observed in wild. The migration ratio of LC in IL-1 was almost the same as that seen in wild. These results suggest that IL-1 may not be a key factor of the contact sensitization in mouse skin. Additionally, we preliminary found that functional changes in immune reaction in TNFαKO mice, however, the findings will be required further study.

Ultraviolet A (UVA) is known to induce the expression of many stress responsive genes due to the generation of reactive oxygen species (ROS). However, UVA's role in inducing metallothionein (MT) gene expression has not been studied. Furthermore, Ishizaki et al. (1996) demonstrated that UVA enhanced 12-o-tetradecanoylphorbol-13-acetate (TPA)-mediated induction of ornithine decarboxylase (ODC) activity in mouse skin. Considering these facts, we examined the interaction of UVA, TPA and antioxidants on the induction of MT and ODC mRNA in mouse skin. UVA (19J/cm$^2$) induced MT mRNA in mouse skin. The study using antioxidants suggest that ROS produced by UVA exposure may contribute to its ability to induce MT mRNA. UVA enhanced TPA-mediated ODC enzyme activity and TPA-mediated MT mRNA induction. Alpha-tocopherol pretreatment inhibited the induction of ODC enzyme activity by TPA treatment combined with UVA exposure (TPA+UVA). In addition, pretreatment of mouse skin with curcumin resulted in the almost complete inhibition of TPA- and/or UVA-mediated gene expression. These results demonstrate that UVA can induce MT gene expression and enhance TPA-induced ODC and MT gene expression. The data further suggest that these effects are partially mediated by ROS.