GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Relationship between UV-irradiated HaCaT cell cytokines and Th1/Th2 imbalance

H.Y. Li[1,2], F.R. Zhang[1,3] and D.Q. Deng[4]

[1]Shandong Provincial Hospital for Skin Diseases, Shandong University, Jinan, Shandong, China
[2]Department of Dermatology, The Affiliated Hospital of Binzhou Medical University, Binzhou, Shandong, China
[3]Shandong Provincial Institute of Dermatology and Venereology, Jinan, Shandong, China
[4]Department of Dermatology, The Second Affiliated Hospital of Kunming Medical University, Kunming, Yunnan, China

Corresponding author: D.Q. Deng
E-mail: lihaiying_l@163.com

Genet. Mol. Res. 14 (3): 7976-7985 (2015)
Received September 30, 2014
Accepted April 28, 2015
Published July 17, 2015
DOI http://dx.doi.org/10.4238/2015.July.17.5

ABSTRACT. We have previously found that an imbalance of Tc1/Tc2 T cell subtypes *in vivo* impacts the development of photodermatitis. The aim of this study was to investigate the relationship between cytokines derived from keratinocytes exposure to UV and the imbalance of Th subgroups. We used different doses of UVA and UVB to irradiate HaCaT cells. Twelve hours after irradiation, the expression of IL-10R, IL-4R, IL-12R, and IFN-γR proteins was observed using the S-P method, and the percentage of positive cells calculated. Protein levels of the respective ligands in the supernatant was measured by ELISA. Our results showed low levels of expression of the interrogated proteins in unirradiated HaCaT cells, and little or no expression could be detected in the supernatant. Little or no expression was also observed for IL-12R

and IFN-γR 12 h after UVA or UVB irradiation. However, the expression of IL-10R and IL-10 was upregulated 12 h following UVB irradiation, as well as following lower dose UVA irradiation. In contrast, higher dose UVA decreased the expression of IL-10R and IL-10. The expression of IL-4R was increased following high doses of UVA and UVB irradiation, whereas no expression was observed after lower dose UV exposure. There was no change in IL-4 secretion into the supernatant. Our results demonstrate that the effects of UV exposure on keratinocyte-derived cytokines are different according to the doses of irradiation and the types of cytokines, and suggest that keratinocyte-derived cytokines after UV exposure might cause an imbalance of Th1/Th2.

Key words: Irradiation; HaCaT cells; Cytokines; Th cells

