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The anti-inflammatory effect of curcumin in UVB-irradiated HaCaT cells

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Excessive UVB irradiation induces expressions of cytokines such as IL-6, IL-8, and TNF- α , in keratinocytes, and resulting in acute inflammation in skin. Curcumin, extracted from the rhizomes of *Curcuma longa*, has been described as having antioxidant, anti-inflammatory, and anti-carcinogenic properties. In addition curcumin regulates the activation of NF-kB and mitogen activated protein kinases (MAPKs) in cells. Thus curcumin is a promising natural agent for modulating inflammatory responses. However, it still remains to be elucidated whether curcumin inhibits the UVB-induced expressions of IL-6, IL-8, and TNF- α in HaCaT cell lines. In this study we investigated the effects of curcumin in expressions of IL-6, IL-8, and TNF- α in HaCaT cells and molecular mechanisms underlying inhibitory properties of curcumin. UVB-irradiated HaCaT cells clearly showed that increased expression of IL-6, IL-8, and TNF- α by a dose-dependent manner of UVB (0, 100, 200, 300 mJ/cm²). Interestingly, pretreatment of curcumin (40 μ M) dramatically reduced the expressions of UVB-induced IL-6 and TNF- α , but not IL-8. In addition activations of NF-kB and MAPKs (p38, JNK, ERK) by UVB, playing key roles in expressions of cytokines, were partially attenuated by pretreatment of curcumin in HaCaT cells. These results collectively suggest that curcumin may inhibit IL-6 and TNF- α expressions in UVB-treated HaCaT cells. Furthermore, the apply of ointment containing curcumin partially protected the erythema and skin atropy in UVB-irradiated hairless nude mouse. Thus, our data showed that curcumin may be applied as a promising anti-inflammatory agent through modulation of proinflammatory cytokines such as IL-6 and TNF- α .