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Protective effect of resveratrol on the oxidative stress-induced inhibition of gap junctional intercellular communication in HaCaT keratinocyte

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The aim of this study was to investigate the effect of resveratrol on the oxidative stress-induced inhibition of gap junctional intercellular communication (GJIC) in HaCaT keratinocyte. Anti-oxidative activity of resveratrol was measured by a,a-diphenyl-b-picrylhydrazyl (DPPH) assay and dichlorodihydrofluorescein diacetate oxidation assay. GJIC of HaCaT keratinocyte was assessed using the scrape loading/dye transfer technique. Western blots and reverse transcription-polymerase chain reaction were also analyzed for Connexin 43 protein and mRNA expression, respectively. Resveratrol scavenged directly the stable DPPH radical over a concentration range of 4 mg/ml (78.2 ± 2.7% of control) to 500 mg/ml (29.9 ± 4.2% of control) and prevent to increase the intracellular fluorescence induced by oxidative stress significantly. Ultraviolet A irradiation (UVA) and 12-*O*-tetradecanoylphorbol-13-acetate markedly reduced GJIC, which was restored by resveratrol. There were no significant differences in the level of Connexin 43 protein and mRNA expression among any of the experimental groups. Our data suggests that resveratrol has the protective effect on the oxidative stress-induced inhibition of gap junctional intercellular communication in HaCaT keratinocyte and this protection is likely due to the scavenging of reactive oxygen species.