

Anti-melanogenic effects of resveratrol-enriched rice

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[Introduction]

Resveratrol, a substance produced by stilbene synthase in limited number of plants such as peanuts and grapevines, has been widely used in the cosmetics and pharmaceutical industries because of its pharmacological activities, which include antitumor, anti-inflammation, and anti-aging effects. Recent reports have shown that resveratrol produced therapeutic effects against hyperplastic skin disorders by inhibiting keratinocyte proliferation, inhibited skin photoaging by acting as a Sirt-1 agonist, and showed anti-cancer effects in human melanoma cell lines. Rice is one of the most consumed cereal grains and has been used in cosmetics industry in Korea, China, and Japan.

[Materials and Methods]

B16F10 mouse melanoma cells were cultured in Dulbecco's modified eagle medium (DMEM) with 10% fetal bovine serum and penicillin/streptomycin in air containing 5% CO₂ at 37°C. The melanin content was determined according to the modified methods of Hosoi *et al.* B16F10 cells were cultured at 5×10⁴ cells/well in 48-well plates. After 24 h, the cells were stimulated by α-MSH 100 ng/ml. At the same time, various concentrations of extract of resveratrol-enriched rice treated for 48 h. After washing with phosphate buffered saline (PBS), the cells were harvested by trypsinization. The cell pellet was solubilized in 200 μl of 1 N NaOH. The absorbance of each well was measured at 405 nm using a spectrophotometer.

[Results and Discussions]

The melanin contents were increased in α-MSH-stimulated control cells as compared to the nonstimulated normal cells. However, resveratrol treatment significantly decreased melanin production without cell toxicity after 48 h treatment in α-MSH stimulated B16F10 cells. Melanogenesis mainly depends on regulation of melanogenic proteins such as tyrosinase, TRP-1, and TRP-2. The protein expression of tyrosinase, TRP-1, and TRP-2 were increased by α-MSH treatment. But, resveratrol led to a significant decrease in α-MSH-induced melanogenic protein levels at 100 μM. We confirmed the inhibitory effects of resveratrol on melanin synthesis via regulation of melanogenic proteins such as tyrosinase, TRP-1, and TRP-2 expression in B16F10 cells.

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