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Analysis of changes in microRNA expression profiles in response to the troxerutin-mediated antioxidant effect in human dermal papilla cells

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Dermal papilla (DP) cells function as important regulators of the hair growth cycle. The loss of these cells is a primary cause of diseases characterized by hair loss, including alopecia and evidence has revealed significantly increased levels of reactive oxygen species (ROS) in hair tissue and DP cells in the balding population. In the present study, troxerutin, a flavonoid derivative of rutin was demonstrated to have a protective effect against H_2O_2 mediated cellular damage in human DP (HDP) cells. Biochemical assays revealed that pretreatment with troxerutin exerted a protective effect against H_2O_2 induced loss of cell viability and H_2O_2 induced cell death. Further experiments confirmed that troxerutin inhibited the H_2O_2 induced production of ROS and up-regula¬tion of senescence associated β galactosidase activity. Using microRNA (miRNA) microarrays, the present study identi¬fied 24 miRNAs, which were differentially expressed in the troxerutin pretreated, H_2O_2 treated HDP cells. Subsequent prediction using bioinformatics analysis revealed that the altered miRNAs were functionally involved in several cell signaling pathways, including the mitogen activated protein kinase and WNT pathways. Overall, these results indicated that ROS mediated cellular damage was inhibited by trox¬erutin and suggested that the use of troxerutin may be an effective approach in the treatment of alopecia.

Biography

Ghangtai Lee has completed his PhD from Chungbuk University. He is the Director of Future R&D Center, Coreana Cosmetics Co. Ltd.

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