AESTHETIC AND COSMETIC DERMATOLOGY (LASERS SEPARATE CATEGORY)

THE ADIPOGENESIS EFFECT OF THE THEAFLAVIN-ENRICHED EXTRACT ON HUMAN SUBCUTANEOUS FAT CELLS

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Background: Subcutaneous adipose tissues are important in maintaining skin structure and preventing skin aging. Especially, subcutaneous adipose tissues as fat depots are intrinsically as well as extrinsically modulated in skin with age. In particular, senescence tends to collapse the skin structure through reducing the lipid contents of subcutaneous adipocytes. In this study, theaflavin (TF) has been suggested that it provides an opportunity to be a potential natural substance for regulation of lipid metabolism (lipogenesis) in human subcutaneous adipocytes.

Objective: The aim of our study is to modulate lipid metabolism-based anti-aging in human subcutaneous fat cells using a co-fermented green tea (GT) fraction with high compositions of TF.

Materials and methods: Primary human subcutaneous fat cells (hSCFs) were used as a model of subcutaneous adipocytes. Prior to biological evaluations of TF, TF-enriched co-fermented green tea (CoF-GT) fraction containing a high level of TF was isolated and obtained after the specific improved fermentation process of GT with garland chrysanthemum (GC). Fermented GT (F-GT) fraction containing a high level of TFDG was also achieved through a common fermentation process. Using CoF-GT or F-GT fractions, the differentiation effects were tested in hSCFs.

Results: The CoF-GT promoted adipogenesis and LD formation, which were proved by the analysis of peroxisome proliferator-activator receptor gamma (PPARγ) and adiponectin (Adipoq) using a real-time quantitative polymerization chain reaction (RT-qPCR) and an enzyme-linked immunosorbent assay (ELISA). On the other hand, F-GT inhibited adipogenesis and lipid droplet (LD) formation in vitro. Depending on compositions of polyphenols, fermented or co-fermented tea extracts showed different effects on lipogenesis of hSCFs.

Conclusions: TF-enriched samples show beneficial effect on differentiation hSCFs, leading

to positive effects on lipid metabolism-modulated anti-aging of skin. Our findings suggest that individual TF could have different biological effects on differentiation of skin adipocytes, leading to development of anti-aging substances.