WHITE-TO-BEIGE TRANS-DIFFERENTIATION OF ADIPOSE-DERIVED STEM CELLS BY SMALL MOLECULE ISOLIQUIRITIGENIN TREATMENT

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Abstract - Obesity is dramatically increasing worldwide and adipose tissues play an essential role in regulating metabolic homeostasis. The development of the beige cells that has beneficial metabolic, but how thermogenic stimuli activate and control beige adipocytes is not fully understood. Here, we investigated that the effects and mechanism of isoliquiritigenin (ILG) on human adipose-derived stem cells (hASCs) differentiate into functional beige/brown adipocytes. We found that hASCs derived white adipocytes are able to switch to a brown phenotype by expressing both UCP1 and CIDEA according to low dose ILG treatments. Although various pharmacological activities of ILG, the possible role of ILG in white-to beige transdifferentiation of adipose-derived stem cells have never been explored. Moreover, we demonstrated that ILG small molecule dose-response in distinct regulatory mechanisms and functions to induce the white-to-beige trans-differentiation of adipose-derived stem cells. These studies suggest that the induction of thermogenic adipocytes might offer a new approach to combating human metabolic diseases.

Keywords - Adipose-derived stem cells, beige adipocytes, small molecule, trans-differentiation