Abstracts *(Oral Presentation)*

Anti-adipogenic Differentiation Effect of Andrographolide on Human Bone Marrow Mesenchymal Stem Cells

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Abstract

Introduction: Since Obesity has become a major public health concern, a strategy to prevent or reduce obesity is a priority. The inhibition of lipid droplet accumulation and adipogenesis process provides a target for treatment of obesity. Andrographolide (AP), the major bioactive phytoconstituent of *Andrographis paniculate,* processes diverse pharmacological properties including antioxidant and anti-inflammatory. However, the effects on adipogenic differentiation of hBM-MSCs were still unknown.

Objectives: We examined the effect of andrographolide (AP) on adipogenic differentiation of hBM-MSCs.

Methods: hBM-MSCs were cultured in adipogenic differentiation condition and treated with Andrographolide (1 - 10 μM) for 7 - 21 days. At the indicated time point, adipogenic differentiation was determined by detection of lipid accumulation using nile red staining. The expression of adipogenic specific marker genes and adipokine secretions were performed by qRT-PCR and cytometric bead array, respectively. Screening of regulatory factor genes involving adipogenesis were explored by a NanoString nCounter analysis.

Results: The result showed that AP at dose 1 - 10 μM reduced the adipogenic differentiation of hBM-MSCs as indicated by the downregulation of adipogenic transcription factors mRNA expression including C/EBPα, PPARγ and SREBP1C, and the decrease of adipogenic marker genes including Adiponectin, GLUT4, FABP4, and LPL. AP also suppressed the adipocyte function as it decreased the secretion of adipokines. Gene screening analysis showed negative regulation of genes involved in the adipogenesis process.

Conclusions: We demonstrated, for the first time, an anti-adipogenic differentiation of hBM-MSCs by AP. The compound may potentially be a novel therapeutic agent for treatment of obesity as well as obesity-related diseases.

Keywords: Andrographolide, Obesity, Adipogenic differentiation, Bone marrow derived mesenchymal stem cells

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