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Barbaloin Regulates Brown Adipocyte Differentiation via Phosphorylation of AMPK

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Barbaloin (Bar) is a major compound isolated from aloe, a widely used medicine to treat various inflammation-related diseases. Obesity is regarded as a low-grade inflammatory state according to several studies. Brown adipocytes play an important role in regulating energy balance, and there is a good correlation with obesity. In spite of several studies confirming the various effects of Bar on inflammation, its effect on brown adipocytes has not been reported to date. Therefore, this study examined the regulatory action of Bar in brown adipogenic differentiation using primary brown preadipocytes. For this, expressions of uncoupling protein 1 (UCP-1) and peroxisome proliferator-activated receptor gamma coactivator 1-alpha (PGC-1 α) were determined by real-time RT-PCR. Western blot was used to assess the protein levels of AMP-activated protein kinase α (AMPK α) and p-AMPK α . Our results clearly showed that expressions of brown adipocyte-related genes, such as UCP-1 and PGC-1 α were dramatically up-regulated by treatment with Bar. In addition, Bar successfully activated the phosphorylation of AMPK α . Our study shows that Bar is capable of increasing differentiation of brown adipocytes via activation of p-AMPK α , suggesting its potential therapeutic application in the treatment or prevention of obesity. Our results show that Bar induces brown adipocyte differentiation via activation of AMPK axis. Therefore, Bar may be beneficial in the treatment of obesity and can be used as a safe natural promoter of health.

Biography:

Currently in Ph.D. course in Science in Korean Medicine at Kyung Hee University, Seoul, Republic of Korea. MS: Kyung Hee University, Cancer Preventive Material Development, 2015 (Dissertation: Inhibitory Effect of Chrysophanic Acid on 5 Alpha-reductase in Testosterone-induced Benign Prostatic Hyperplasia) BS: Gyeongju University, Herbal Resources, 2013.