

World Congress on

Nutrition and Obesity Prevention Source

November 16-18, 2017, Barcelona, Spain

Secoisolariciresinol – 4 – O – Methyl Ether (S4M) Inhibits Adipogenesis in 3T3-L1 Adipocytes

JongWook Kang, Dong-Hyun Youn, Yunu Jung, Seona Lim, Jinbong Park, Hye-Lin Kim, Mi-Young Jeong and Jae-Young Um*

Department of Pharmacology, College of Korean Medicine, Kyung Hee University, 26 Kyungheedaero, Dongdaemun-Gu, Seoul, 02447, Republic of Korea

Introduction: Obesity is a metabolic disorder characterized by chronic inflammation and dyslipidemia and is a strong predictor for the development of hypertension, diabetes mellitus, and cardiovascular disease. Previous reports show that plant lignans, such as secoisolariciresinol diglucoside, actiin and pinoresinol diglucoside have anti-obesity effects. Secoisolariciresinol-4"-o-methyl ether (S4M), a demethylated form of secoisolariciresinol is also a widely known lignan derived from flax seeds. However, its effect on adipogenesis is not reported to date. This study examined anti-obesity functions of S4M by assessing differentiation of adipocyte, adipogenesis related gene and protein expressions.

Methods: The cellular lipid content in 3T3L-1 adipocytes was assessed by Oil Red O staining. Expression of peroxisome proliferators activated receptor- γ (PPAR- γ), CCAAT/enhancer-binding protein α (C/EBP α), adiponectin and resistin were determined by real-time RT-PCR. In addition, expressions levels of PPAR- γ , C/EBP α and phosphorylation level of AMP-activated protein kinase α (AMPK α) were measured by the western blotting assay.

Results: S4M suppressed lipid accumulation during adipocyte differentiation of 3T3-L1 cells. It also reduced cellular induction of several adipogenic genes including PPAR- γ , C/EBP α , adiponectin and resistin. Furthermore, western blot assays confirmed S4M treatment was also effective at protein levels as it suppressed expressions of PPAR- γ and C/EBP α . AMPK α , the key regulator of energy homeostasis was phosphorylated by S4M administration as well. These results demonstrate that S4M has a potent anti-obesity effect in 3T3-L1 cells due to the inhibition of adipogenesis.

Conclusion: Our results demonstrate that, with the continuing spread of obesity prevention as a fundamental medicine strategy, both clinicians and researchers should take a closer look at herbal medicine. S4M 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, Science in Korean Medicine, 2016 (Dissertation : Secoisolariciresinol diglucoside inhibits adipogenesis through the AMPK activation)