

Anti-obesity activities of xanthorrhizol in 3T3-L1 adipocytes

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According to the World Health Organization (WHO), at least 2.8 million people die every year due to overweight or obesity. The increased obesity prevalence has caused major health problems such as cardiovascular diseases and diabetes. Although several anti-obesity drugs have been developed, they are limited due to adverse side effects such as stroke, myocardial infarction, and depression. These circumstances have increased the demand for effective and safe anti-obesity agents. Previous studies demonstrated that xanthorrhizol (XNT) reduced the levels of serum free fatty acid and triglyceride *in vivo*, but the detailed anti-obesity activities are yet to be reported. Thus, this study aims to evaluate the abilities of XNT to impede adipogenesis, stimulate lipolysis, and its related lipolytic mechanisms employing 3T3-L1 adipocytes. Adipogenesis was examined by glycerol-3-phosphate dehydrogenase (GPDH) activity, whilst lipolysis was investigated by quantifying the glycerol amount. The mechanisms involved were further evaluated by protein analysis of leptin and insulin. Statistical significance was established by one-way ANOVA, where $p < 0.05$

and 0.01 were considered statistically significant. In this study, XNT decreased GPDH activity in a dose-dependent manner from 3.125 to 12.5 $\mu\text{g/mL}$. The highest GPDH inhibition and glycerol release was $47.74 \pm 1.36\%$ and $45.37 \pm 1.43\%$ ($p < 0.05$), respectively. Interestingly, XNT-treated adipocytes produced leptin at levels that were two times higher than control ($p < 0.05$) and induced a $64.04 \pm 1.73\%$ reduction in insulin expression ($p < 0.01$). These results revealed that XNT may suppress adipogenesis and stimulate lipolysis through regulation of leptin and insulin expression in the adipocytes. In this conference, I will discuss the anti-obesity activities of xanthorrhizol and how it works based on our recent protein analysis.

Speaker Biography

Seok Fang Oon has her expertise in investigating the potential health effects of natural products. She is doing her PhD research in the anti-obesity activities of xanthorrhizol in University of Putra Malaysia. She has worked as a Senior Research Officer for two years in the project development of antihypertensive and anti-diabetic natural products. Her main research interests include the biological effects of natural products and herbal treatment in hypertension, obesity, diabetes, hyperlipidemia, and cancer

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