

Anti-obesity effect of young persimmon fruit extract in obese mice



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Purpose: Young persimmon fruit (YPF) has recently been reported to have an inhibitory effect on the lipid metabolism. So, this study examined whether YPF has a anti-obesity effect on the lipid metabolism and adipocyte differentiation through the AMP-activated protein kinase (AMPK) pathways in obese mice.

Methods: YPF (100 or 200 mg/kg body weight/day, p.o.) was administered every day for 3 weeks to male 12-week-old obese (db/db) mice, and its effect was compared with non-obese (m/m) and vehicle-treated obese (db/db) mice.

Results: The administration of YPF caused a significant in the body weight and adipose tissue weight in the obese (db/db) mice. The decreased expression of AMPK protein in the adipose tissue of obese (db/db) mice was significantly increased by YPF treatment. Moreover, obese (db/db) mice exhibited a dysregulation of the protein expression related to lipid metabolism and adipocyte differentiation in adipose tissue, but YPF administration significantly reduced the expression of the lipid metabolism and adipocyte differentiation-related proteins through the AMPK pathway. In addition, the size of adipocyte was expand in vehicle-treated obese (db/db) mice, compared with non-obese (m/m) mice, but YPF-treated obese mice clearly showed decreased adipocyte size.

Conclusion: This study provides scientific evidence that YPF improve the obesity through the reduction of lipid metabolism and adipocyte differentiation via AMPK activation in the adipose tissue of obese mice.

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Sasang type is an independent factor for heat capacity



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Purpose: We examined the difference in body components and its influence in specific heat capacity (SpHC), total heat capacity (HC), and resting temperature increment load (Tinc) across Sasang types during the resting state.

unteers (204 men and 317 women) aged between 20 and 68 years by multi-frequency bioelectrical impedance analysis. Resting energy expenditure (REE) was measured by an indirect calorimetry with canopy mode. Sasang types were determined based on integrative data from body measurement, face image, vocal recording, and questionnaire. SpHC, HC, and resting Tinc were calculated.

Results: The TE type had a lower SpHC and a higher HC than those in the SE and the SY type in both genders ($p < 0.001$). The SpHC was slightly higher in the SE than that in the SY type (0.754 ± 0.014 vs 0.747 ± 0.015 , $p = 0.02$ in male; 0.726 ± 0.015 vs 0.721 ± 0.014 , $p = 0.06$ in women), whereas the SY had a higher HC than that in the SE type (53.5 ± 4.9 vs 47.8 ± 4.6 , $p < 0.001$ in men; 39.7 ± 3.6 vs 37.5 ± 3.2 , $p < 0.001$ in women). Adjustment for age, gender, body weight, BSA, and BMI attenuated the difference but did not dismiss completely. Resting Tinc was calculated as REE divided by HC. The TE type had a lower resting Tinc than that in the SE and SY types, independently to age and gender ($p < 0.001$).

Conclusion: The findings suggested that the temperature regulation in each Sasang constitution may be quantitatively different because of HC differences. This work is supported by NRF, No. 2012-0009829

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Vitisin B stimulates osteoblastogenesis via estrogen receptor-mediated pathway



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Purpose: Vitisin B is a major component existed in *Vitis thunbergii*, a herbal medicine used in Taiwan for treatment of inflammatory bone diseases. We recently reported that vitisin B stimulated differentiation in primary cultured osteoblasts and treatment with vitisin B-enriched preparation obviously ameliorated ovariectomy-induced bone loss in mice. This study further delineated the action mechanism(s) that how vitisin B stimulates osteoblastogenesis by using MC3T3-E1 osteoblasts.

Methods: Cell differentiation and mineralization were identified by alkaline phosphatase (ALP) activity and Alizarin red S staining, respectively. RT-PCR and western blot were used to analyze the expression of osteoblast-associated genes and signal molecules. The transcriptional activity of estrogen receptor (ER) was also assessed.

Results: Vitisin B significantly increased ALP activity, bone mineralization, mRNA expression of osteoids (type 1 collagen, bone sialoprotein and osteocalcin) and bone-characteristic transcription factors (runt-related transcription factor-2 and osterix) through ER since such responsiveness were obviously repressed by ER antagonist ICI182,780. Unlike 17β -estradiol (E₂), vitisin B failed to stimulate either ER α - or ER β -mediated transcriptional activity. Nevertheless, vitisin B rapidly induced ER α and Src phosphorylations within 5 min and evoked late

phosphorylations of p38 and ERK after 15-30 min stimulation through ER. Furthermore, SB203580 and PD98059 significantly inhibited vitisin B induced differentiation. By using Src inhibitor PP2, results further supported that Src is a cross molecule required for vitisin B-induced activation of MAPK and final mineralization.

Conclusion: Vitisin B might act through ER-mediated activation of Src and downstream MAPK to stimulate osteoblastogenesis which contributed to its beneficial effect in prevent bone loss.

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Metabolomic-based evidence for acupoint specificity in treating migraine

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Purpose: The aim of the current study was to investigate the metabolomic evidence for acupoints specificity in treating migraine by using 1H nuclear magnetic resonance (NMR)-based metabolomic technology.

Methods: We recruited 60 migraine patients and 10 health adults. First, 1H-NMR experiment and multivariate analysis were conducted to characterize metabolic profiling of migraine. Second, migraine patients were randomly assigned to special acupoints group and non-acupoints group. Acupuncture treatment were accordingly practiced on these group lasted for two sessions. 1H-NMR experiment was conducted, multivariate analysis and bioinformatics technique were used to investigate the metabolomic evidence for acupoints specificity in treating migraine

Results: We found that 14 of metabolites in the plasma and 6 of metabolic pathways were significantly related to migraine ($P < 0.05$). Importantly, the enhancement of glucose metabolism including increases of citrate, acetate, pyruvate ($P < 0.05$) and related metabolic pathways such as citrate cycle pathway, pentosephosphate pathway ($P < 0.01$) in the plasma of migraine patient were revealed to be the metabolic basis of triggering migraine attack. Intriguingly, metabolic profiling of special acupoints became similar to health adults as acupuncture treatment session increases. 5 metabolites and 4 metabolite pathway, including citrate, acetone, pyruvate, glutamine, creatine and Citrate cycle pathway, were significant reversed after 2 session of acupuncture treatment. In contrast, metabolic profiling of non-acupoints group was clearly separated from health adults as treatment session increases. Interestingly, glutamine, a classic metabolite triggering migraine, was found decreases in both acupoint group and non-acupoint group after acupuncture treatment.

Conclusion: Our data suggest acupuncture might exhibit non-specific effect on both acupoints and non-acupoints by decreasing plasma glutamine therefore relieving migraine

attack. Whereas, acupuncture at acupoints were firstly revealed to have special effect on reversing glucose metabolism and Citrate cycle pathway in the plasma of migraine patients thereby treating migraine.

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Licorice and its flavonoids inhibit oxidative damage in the liver



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Purpose: Glycyrrhizae Radix (*G. radix*) is an important herb used in traditional oriental medicine for the replenishment and invigoration of deficient Qi and blood, and is also widely recommended for its life-enhancing properties as well as detoxification.

Methods: In this study, we determined the therapeutic effects of the extract of *G. radix* and its flavonoids on the liver injury in animals and cells.

Results: Toxicants injections in rats exerted severe liver damage assessed by increased plasma levels of alanine aminotransferase and aspartate aminotransferase in addition to hepatic degeneration and necrosis. These pathological changes were markedly protected by pretreatment with the flavonoids and licorice extract. Moreover, the flavonoids and the extracts pretreatment reversed the decrease in hepatic antioxidant capacity as well as suppressed expression of anti-inflammatory genes in the liver as well as in cells.

Conclusion: These results suggest that the licorice has a protective effect through induction of antioxidant and anti-inflammatory activities. This work was supported by the National Research Foundation of Korea (NRF) Grant funded by the Korea government (MSIP) (No. 2014R1A2A2A01007375), and by the NRF Grant funded by the Korea government (MSIP) (No. 2012R1A5A2A42671316).

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