



IUNS

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Abstracts

Guest Editors

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MATERNAL SUPPLEMENTATION WITH FLAVONOIDS AND ANTI-OBESITY EFFECT IN THE OFFSPRING OF OBESE FEMALE RATS

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Maternal obesity is a risk factor in the development of metabolic diseases of offspring including, obesity, diabetes and metabolic syndrome. This may be due to an influence by different environmental effects such as maternal feeding during early stages of life, commonly known as perinatal programming. The use of animal models in this studies helps to analyse the mechanisms by which physiological and metabolic changes can promote the development of diseases in the adult stage. Dietary supplementation with flavonoids has been studied regarding the biological properties and its effect in the prevention of diseases such as obesity. Therefore, the aim of this study was to determine the effect of the narirutin and kaempferol-3-O-glucoside on the prevention of metabolic disorders in the offspring of female Wistar rats fed and obesogenic diet during perinatal period.

Material and methods: Obesogenic group of female rats were fed with a cafeteria diet (372 kcal/100g) and supplemented group (n=2) with cafeteria diet supplemented with kaempferol-3-O-glucoside (15 mg/kg bw) and narirutin (30 mg/kg bw) during perinatal period (7 weeks); a parallel a control group (n=2) were fed a standard diet (335 kcal/100g). After the lactation period (3 weeks), male offspring (control G1 group (n=12), obesogenic G1 group (n=9) and supplemented G1 group (n=9)) were fed standard diet for 91 days. Body weight and food intake were recorded weekly. After the experimental period, animals were sacrificed and serum and tissue samples were obtained.

The obesogenic model was successfully achieved, showing statistical differences between control group and obesogenic group. According to the offspring male rats, changes in body weight were observed in the supplemented group compared to the obesogenic group ($p < 0.05$). Likewise supplemented group showed statistically significant lower liver weight and lower fat percentage than the cafeteria group ($p < 0.05$). Food intake (g) and food efficiency (g/100 kcal) were significantly lowered in male offspring of supplemented female rats. On the other hand, regarding biochemical measurements, there were no differences in glucose levels, however significant differences were found in leptin and insulin levels. Concerning the molecular mechanisms implicated, differences in the expression of genes involved in inflammation, glucose and lipid metabolism were observed in liver and adipose tissue between obesogenic group and supplemented group.

In this context, the obesogenic diet during perinatal period in female wistar rats induces metabolic alterations and an increase dietary intake in their male offspring in adulthood. In addition, dietary supplementation with flavonoids could prevent the development of obesity in the adult offspring.

Keywords: Narirutin, kaempferol-3-O-glucoside, metabolic programming, obesity, nutrigenomics

POLYPHENOLS FROM BERRIES INHIBIT INFLAMMATION-RELATED ADIPOSITY

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Obesity-associated insulin-resistance is set by a chronic inflammatory state established in the adipose tissue. Chilean native fruits calafate (CA) and maqui (MA) berries present remarkable anti-inflammatory features. We have been evaluated antioxidant, anti-inflammatory and insulin-sensitizer effects of these fruits in an in vitro and in vivo inflammatory setting. We exposed differentiated 3T3-L1 cells to conditioned media (CM) from activated macrophages that were treated with CA and MA extracts. Extracts modulated beneficially: metalloproteinase (both MMP-2 and MMP-9) activity, GSH levels, caspase-3 activity, and inflammatory markers gene expressions. Furthermore, MA reverted CM specific IRS-1 phosphorylation, and CA improved insulin-stimulated glucose uptake. Similar experiences were observed in a in vivo model (mouse), that were induced to present inflammatory-related insulin-resistance by a chronic exposure to high fat diet. Thus, treatments with extracts of Chilean native fruits were able to block the development of oxidative stress, inflammation and insulin-resistance in vitro and in vivo.

Keywords: Obesity, inflammation, insulin-resistance, polyphenols, chilean native fruits

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PHYTONUTRIENTS IN NUTRITION AND HEALTH: FROM THEORY TO PRACTICE

QUERCETIN PROTECTS AGAINST ATHEROSCLEROSIS BY INHIBITING DENDRITIC CELL ACTIVATION

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Objective: Quercetin is a typical flavonol with atheroprotective effects, but the effect of quercetin on dendritic cell (DC)



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