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LI-P03
MENADIONE MODULATES ADIPOGENIC DIFFERENTIATION BY INHIBITION OF PI3K/AKT PATHWAY IN 3T3-L1 CELLS

Iglesias González PA; Conde MA; Salvador GA; Uranga RM
Instituto de Investigaciones Bioquímicas de Bahía Blanca (INIBIBB). DBByF-UNS.E-mail: ruranga@inibibb-conicet.gob.ar

We have previously demonstrated that menadione-induced oxidative stress significantly diminishes adipogenesis and is able to dephosphorylate and inactivate phosphatidylinositol 3-kinase (PI3K)/Akt pathway in 3T3-L1 cells (SAIB 2017). To investigate this unexpected behavior of this adipogenic key pathway against oxidative stress, we mimicked menadione effect by studying adipogenic differentiation in the presence of LY294002, a well known PI3K inhibitor. In the absence of menadione, we found that PI3K inhibition drastically decreased adipogenesis. At a molecular level, the expression of peroxisome proliferator activated receptor gamma (PPAR gamma), the master regulator of adipogenesis, was also found to be decreased. To investigate if PI3K/Akt pathway was responsible of menadione-caused adipogenesis inhibition, we used insulin in the presence of menadione as a PI3K gain-of-function strategy, both being present during the whole differentiation process. These experiments showed that insulin was sufficient to rescue PPAR gamma expression, without altering cell viability. These results show that PI3K/Akt is a key pathway in the antiadipogenic effect of menadione on 3T3-L1 cells.

LI-P04
MODULATION OF HEPATIC TRIACYLGLYCEROL IN RATS FED WITH A FUNCTIONAL MILK FAT

Gerstner C[12]; Lavandera J[12]; Sain J[1]; Scanarotti I[1]; Gonzalez M[1]; Bernal C[12]
[1]Cátedra de Bromatología y Nutrición. Facultad de Bioquímica y Cs. Biológicas. UNL. [2]CONICET. E-mail: cgerstner17@gmail.com

A Functional Milk Fat (FMF) enriched with Conjugated Linoleic Acids (CLA) and trans-Vaccenic Acid (VA; t11-18:1) showed a potential health benefits on lipid regulation. The aim was to study some biochemical mechanisms involved in liver triacylglycerol (TAG) regulation of rats fed FMF at high fat levels. Male Wistar rats were fed (60-d) with S7 (soybean oil –SO- 7%), S30 (SO 30%), MF30 (SO 3%+ Milk Fat -MF- 27%) or FMF30 (SO 3%+ FMF 27%) diets. TAG levels, TAG secretion rate (TAG-SR), fatty acids (FA) composition, FA incorporation, lipogenesis and β-oxidation were determined in liver. Statistical analysis: Student's t test or ANOVA (1x3) and Tukey's test, *: $p<0.05$. Compared to S7, S30 diet increased liver TAG content and FA incorporation reflected by a higher FATP2, FATP5 and CD36 gene expression. FMF30 and MF30 reduced liver TAG accretion (-31.4* and -31.3%*), and the changes (%) vs S30 diet were: 1) TAG-SR, FMF30: +31.2* and MF30: +7.0; 2) liver FA incorporation: mRNA levels of FATP2, FMF30: -47* and MF30: -39*; FATP5, FMF30: -19 and MF30: -33*; CD36, FMF30: -51* and MF30: -82*; 3) lipogenesis: activities of: G6PDH, FMF30: -24* and MF30: -34* and FAS, FMF30: +6.3 and MF30: -31.7*, and mRNA levels of: ACC, FMF30: +59* and MF30: +24.7; FAS, FMF30: +80* and MF30: +89*; SCD1a, FMF30: +529* and MF30: -7.9; DGAT, FMF30: -26.4 and MF30: -46.3* and PPARγ, FMF30: +68* and MF30: +19.7, and SCD1a index, FMF30: +236* and MF30: +192* and 4) β-oxidation: CPT-Ia activity, FMF30: +32* and MF30: -31*; mRNA levels of: ACO, FMF30: -1.3 and MF30: -44.6* and PPARα, FMF30: +58* and MF30: -15. CLA and VA of FMF provided additional mechanisms of lowering liver TAG content

LI-P05
EFFECT OF A FUNCTIONAL MILK FAT ON OXIDATIVE STRESS AND INFLAMMATION IN RATS FED HIGH FAT LEVEL

Quiroz N[1]; Contini MC[1]; Vera Candioti L[12]; Bernal C[12]; Gonzalez M[1]
1Cátedra de Bromatología y Nutrición – Facultad de Bioq. y Cs. Biológicas – UNL. 2CONICET. E-mail: nahue75@hotmail.com

High intake of fat, includingMilk Fat (MF), has been associated with oxidative stress, inflammation and Non-Communicable Chronic Diseases (NCCD) risk. However, the MF can be modified through decrease of saturated fatty acids and increase bioactive components, leading to a Functional Milk Fat (FMF). Since, the analysis of biomarkers for oxidative stress and inflammatory state in liver is essential for the diagnostic and control of NCCD, the aim of this study was to investigate some of these biomarkers in rats fed diets containing MF and FMF at high levels. Male Wistar rats were fed (60-d) with S7 (soybean oil, 7%), S30 (soybean oil, 30%), MF30 (soybean oil, 3% + MF, 27%) or FMF30 (soybean oil, 3% + FMF, 27%) diets. The reduced glutathione to oxidized glutathione (GSH/GSSG) ratio by Capillary Electrophoresis, Lipoperoxidation (LPO) by TBARs and mRNA expression of Catalase (CAT), Glutatione Peroxidase(GSH-Px), Glutatione Reductase (GR), the nuclear factor (NFκβ), Nuclear Factor Erythroid-2 (Nrf2) and proinflammatory cytokines (TNF-α and IL6) by RT-PCR were assessed in liver. Compared withS7, S30 and MF30 increased LPO and expression of NFκβ, Nrf2 and CAT. The GSH/GSSG ratio decreased in both groups respect to S7. The expression of IL-6 and TNF-α increased in MF30 compared with S7. FMF30 decreased LPOand the mRNA expression of CAT, NFK-β, Nrf2, TNF-α, and IL6 reaching values similar to S7. In conclusion, the intake of FMF30 was able to attenuate the stress and inflammatory status caused by the consumption of high levels of fat, which could contribute to reduce the NCCD risk.