

# **Effect of a Conjugated Linolenic Acid Mixture on the Triacylglycerol Accumulation in 3T3-L1 Mature Adipocytes**

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In recent years, an extensive investigation concerning possible health benefits of conjugated fatty acids is being carried out in order to be used as functional ingredients. The potential use of conjugated linoleic acid (CLA) as an anti-obesity molecule for humans is still a matter for debate. Thus, a great deal of scientific work is focused on the research of new effective molecules without deleterious effects on health. One example of these molecules is conjugated linolenic acid (CLNA), which effect on adiposity has not yet been fully described.

The purpose of the present work was to analyze the effects of a CLNA mixture, obtained by an alkaline isomerization process, on triacylglycerol (TG) accumulation in 3T3-L1 mature adipocytes, and to go through the mechanisms of action of this mixture. Confluent 3T3-L1 pre-adipocytes were differentiated to mature by using an induction media. On 12th day after differentiation cells were treated with the CLNA mixture at 10 and 100  $\mu$ M doses. Cells were harvested 20 hours after the treatment and TG content was quantified. Total cell RNA was extracted with Trizol and PPAR $\gamma$  (peroxisome proliferator-activated receptor), LPL (lipoprotein lipase), ACC (acetyl-CoA carboxylase), FAS (fatty acid synthase), SREBP1c (sterol regulatory element binding protein), HSL (hormone-sensitive lipase) and ATGL (adipose triglyceride lipase) gene expressions were measured by real time RT-PCR.

Both doses of the CLNA mixture decreased TG content (-21% and -18% respectively). Only the lower dose (10  $\mu$ M) increased HSL expression. In contrast, only the higher dose (100  $\mu$ M) increased ATGL gene expression. A lack of changes was observed in the remaining analyzed genes.

The decrease in TG content induced by the CLNA mixture in mature adipocytes can be due, at least in part, to lipolysis activation. Consequently, although further research is needed, this CLNA mixture may be proposed as a potential anti-obesity molecule.

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