

PGC1 α isoforms expression in skeletal muscle of trained and/or CLA supplemented mice

Rosario Barone, Claudia Sangiorgi, Antonella Marino Gammazza, Daniela D'Amico, Francesco Cappello, Giovanni Zummo, Felicia Farina, Valentina Di Felice and Filippo Macaluso

Department of Experimental Biomedicine and Clinical Neurosciences, University of Palermo, Palermo, Italia

It has been reported that Conjugated Linoleic Acid (CLA) improves muscle hypertrophy [1], steroidogenesis [2], physical activity, and endurance capacity in mice [3]. Recently, it has been reported that endurance exercise increased the expression of PGC1 isoforms in murine skeletal muscle [4]. The aim of the present study was to quantify the expression of any of the peroxisome proliferator-activated receptor γ coactivator 1 α (PGC1 α) isoforms in gastrocnemius and plantaris muscles of trained and/or CLA supplemented mice. Mice were randomly divided in four groups: placebo sedentary, CLA sedentary, placebo trained, or CLA trained. The CLA groups were gavaged with 35 μ l per day of Tonalin® FFA 80 food supplement containing CLA throughout the 6-week experimental period, whereas the placebo groups were gavaged with 35 μ l sunflower oil each day. Each administered dose of CLA corresponded to approximately 0.7 g/kg or 0.5%, of the dietary daily intake. Trained groups ran 5 days per week on a Rota-Rod for 6 weeks at increasing speeds and durations. Mice were sacrificed by cervical dislocation and hind limb posterior muscle groups were dissected and used for histological and molecular analyses. Endurance training increased the expression of PGC1 α isoforms (tot, α 1, α 2, and α 3), but CLA supplementation did not increase PGC1 α isoforms expression in trained and/or sedentary mice. In the plantaris muscle, CLA supplementation induced a fibre-type-specific hypertrophy of type IIx muscle fibres.

References

- [1] Di Felice et al. (2007) Effects of conjugated linoleic acid and endurance training on peripheral blood and bone marrow of trained mice. *J Strength Cond Res* 21:1.
- [2] Macaluso et al. (2012) Effect of conjugated linoleic acid on testosterone levels in vitro and in vivo after an acute bout of resistance exercise. *J Strength Cond Res* 26:6.
- [3] Macaluso et al. (2013) Do fat supplements increase physical performance? *Nutrients* 7:5.
- [4] Barone et al. (2016) Skeletal muscle Heat shock protein 60 increases after endurance training and induces peroxisome proliferator-activated receptor gamma coactivator 1 α 1 expression. *Sci Rep* 27:6.

Key words

PGC1 α , endurance exercise, skeletal muscle, muscle fibres.