BOOK OF ABSTRACTS

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Expression of TGF-beta in different adipose tissue depots is singularly regulated by a high-fat diet and energy restriction

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Introduction: Transforming growth factor beta (TGF-β) contributes to the pathogenesis of obesity, playing an important role in adipogenesis, cytokines release and inflammation. In fact, adipose tissue of obese rats and humans seems to express higher levels of TGF-β that activates both SMAD-dependent and independent pathways – the latter include ERK1/2, Akt and MAPK p38-dependent pathways. It is our aim to evaluate the effect of a high-fat diet and energy restriction on TGF-β expression levels and to study TGF-β-related signalling pathways activation on different adipose tissue depots.

Methods: Subcutaneous, epididymal, mesenteric and retroperitoneal adipose tissue of 12 months aged rats, submitted to a (1) high-fat diet (HF; 45% of energy from fat), (2) energy restriction (ER; ingestion of 75% of the feed given to controls), or (3) control diet (4% of energy from fat) were collected. TGF-β expression was evaluated by real-time PCR. Activation of SMAD2/3, ERK1/2 and Akt signalling pathways was assessed by Western-blotting.

Results: Concerning retroperitoneal adipose tissue, HF- and ER-fed rats showed a higher expression of TGF-β, ERK1/2 and Akt compared to controls. However, ER-fed rats showed a lower Smad2/3 expression when compared to controls and HF-fed rats. Curiously, in epididymal and mesenteric adipose tissues, ER-fed rats presented a lower expression of ERK1/2 and Akt, respectively. No significant differences were observed in subcutaneous adipose tissue in rats submitted to different diets concerning TGF-β mRNA expression or ERK1/2, Akt, or Smad3 protein expression.

Conclusions: The effect of diet on TGF-β expression and signalling profile is differently felt across different subtypes of adipose tissue. Among them, the retroperitoneal adipose tissue seems to have a more diet-dependent response.

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