EDITOR’S PREVIEW

In this issue of Adipocyte

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Protective effects of physical activities against LPS-inflammation

pp. 1–11

It is well known that physical activity is highly beneficial for the body on numerous levels, and in this research paper by Peppler et al. the effects of physical activity on inflammation caused by infection are explored. Lipo-polysaccharide (LPS) was used to model the inflammatory response known as sepsis and mice were given access to exercise equipment in order to promote physical activity. Compared to the sedentary control group, the mice who participated in periodic physical activity demonstrated a reduction in LPS-induced inflammation in both inguinal white adipose tissue (iWAT) as well as epididymal white adipose tissue (eWAT). A modest depot-specific effect was observed where the anti-inflammatory effect was greater in iWAT vs eWAT. These changes were also associated with a decrease in body and fat pad weight, improved glucose tolerance, and, increased markers of mitochondrial biogenesis.

Adipogenesis promotion of LOX-PP

pp. 12–19

Lysyl Oxidase (LOX), an enzyme that catalyzes the cross-linking of lysine residues in collagen and elastin, is secreted as an inactive pre-protein which is cleaved into a functional 32kD enzyme (LOX) and an 18 kD propeptide (LOX-PP). Current research shows that LOX-PP hinders fibroblast growth factor-2 (FGF-2) signaling, while FGF-2 inhibits adipogenesis. Here, authors Griner, Rogers, Zhu and Du show how adipogenesis may be promoted by LOX-PP through its ability to impede FGF-2 signaling in pre-adipocytes. An Arg 152 to Glu 152-point mutation in the LOX-PP gene, needed to inhibit FGF-2 receptor, abolished the pro-adipogenic effect of LOX-PP. (Fig. 1).

Adipose derived stem cell and endothelial cell interplay

pp. 20–32

In this research paper, authors Ell et al. take a deeper look in to adipose-derived stem cells (ASC) and their ability to promote angiogenesis, as well as their relationship with endothelial cells. This interplay was observed using a V2a kit, where ASCs were co-cultured on endothelial progenitor cells and compared to control ASC cultures. The study showed an increase in vascular endothelial growth factor (VEGF) in the co-culture samples as well as increases in endothelial cell differentiation, thus shedding light on our understanding of the

Figure 1. Lysyl oxidase propeptide (LOX-PP) dose dependently abolished the inhibitory effects of FGF-2 (5ng/ml) on adipogenesis. Griner et al., p. 14.
stimulatory capacity of ASC especially with respect to endothelial cells and white adipose tissue vasculogenesis (Fig. 2).

Effects of fasting on fatty acid oxidation

Having previously demonstrated the effects of fasting on the upregulation of mitochondrial and peroxisomal fatty acid pathway genes in broiler chickens, authors Torchon et al. seek to determine if these changes in fasting-mediated gene expression may lead to an increase in fatty acid oxidation. In this brief report, the authors present the results of a study which measured fatty acid oxidation in young broiler chicks who had been fasting for various lengths of time. An increase in fatty acid oxidation as well as citrate synthase activity was observed in fasting chicks, confirming the role of fasting and nutritional status on white adipose tissue fatty acid oxidation. Further studies to understand the underlying pathway may provide targets to protect against free fatty acid mediated metabolic dysfunction. (Fig. 3).

Newly generated cell lines for depot-specific adipocyte studies

This brief report by Todorčević et al. introduces several immortalized human preadipocyte cell lines from paired subcutaneous abdominal and gluteal adipose

Figure 2. Differentiation of V2a-cells ASC co-cultures. Anti-CD31 immunostaining with CD31-positive cells stained dark blue/violet. Ell et al., p 25.

Figure 3. Serum glucose and NEFA levels in the fed and after 3, 5, and 7 hours fasting. Torchon et al., p 35.
tissue which have enhanced proliferation and adipogenic capacities making them well suited for use in in vitro culture models. Furthermore, the lines possess the ability to maintain memory of their depot-of-origin, making them ideal for studies which focus on depot-specific adipocytes as the differences in fatty acid metabolism and gene expression patterns between the various locations are maintained. The authors show that these new lines may prove to be extremely useful in further depot-specific human adipocyte research (Fig. 4).

Figure 4. Light microscopy of apAD and gpAD cell lines after adipogenic differentiation. Todorčević et al. p 44.