

P005 Nerve growth factor – an inflammatory mediator in white adipose tissue?

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White adipose tissue (WAT) is a major endocrine organ, secreting a wide range of protein factors (adipokines). The sympathetic nervous system (SNS) plays a central role in the regulation of lipolysis and other key functions in WAT, including leptin production. This study examined whether WAT, and specifically adipocytes, are a source of the neurotrophin NGF - a central signal in the development and survival of the SNS, as well as an immune and inflammatory mediator. RNA was extracted from mouse WAT and 3T3-L1 adipocytes and NGF gene expression examined by RT-PCR and real-time PCR. NGF secretion from 3T3-L1 adipocytes in culture was determined by ELISA. NGF mRNA was detected in all the major WAT depots of mice, the signal being predominantly in mature adipocytes. 3T3-L1 cells expressed the NGF gene in culture and secreted NGF itself. Dexamethasone and the PPAR γ agonists rosiglitazone and 15d-PGJ $_2$ inhibited NGF expression and secretion by 3T3-L1 adipocytes; in contrast, the pro-inflammatory cytokine TNF α and prostaglandins PGD $_2$, PGJ $_2$ and Δ^{12} -PGJ $_2$ strongly stimulated NGF production by these cells. We conclude that NGF is synthesised and secreted by white adipocytes and that the neurotrophin is a key adipokine which may be linked to the inflammatory response of WAT.