

P053 The anti-inflammatory cytokine IL-4 abrogates β -amyloid induced changes in the rat brain

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It has been shown that intracerebroventricular (i.c.v) injection of β -amyloid ($A\beta$) results in impairment of long-term potentiation (LTP), a potential biological substrate for learning and/or memory. This is accompanied by an increase in microglial activation in the hippocampus. Here we show that $A\beta$ induces microglial activation *in vitro* and that this is paralleled by increased production and release of the proinflammatory cytokine, IL-1 β . We show that the anti-inflammatory cytokine, IL-4 prevented these changes, suggesting that IL-4 can suppress the inflammatory changes induced by $A\beta$. On the basis of these findings we investigated whether IL-4 could reverse the impairment in LTP induced by $A\beta$. 24 Male Wistar rats were divided into 4 treatment groups, anaesthetised by intraperitoneal (i.p) injection of urethane (1.5mg/kg) and subsequently given an icv injection of $A\beta$ (5nmol), IL-4 (20mg/ml) or both and assessed for their ability to sustain LTP. We found that $A\beta$ significantly inhibited maintenance of LTP. This impairment was significantly reversed by co-treatment with IL-4. In addition we report that the $A\beta$ -induced activation of JNK in the hippocampus was abrogated by IL-4. These data indicate that the $A\beta$ -induced inhibition of LTP associated with the increase in IL-1 β can be blocked by IL-4.