

P027 The Effects of Soluble and Aggregated A β (1-40) on LTP in the Rat CA1 In Vivo

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Alzheimer's disease is associated with increased deposition of beta-amyloid (A β) peptide, which exerts its neurotoxic effects by increasing the concentration of interleukin 1-beta (IL-1 β) and activation of mitogen activated protein (MAP) kinases. The present study investigated the effect of icv. injection (5 μ l) of water vehicle, soluble A β (1nmol), or A β aggregated for 48 hrs or 7 days on long-term potentiation (LTP) in the CA1 region of adult rat hippocampus.

Soluble A β significantly depressed LTP ($124 \pm 8\%$, n=5) compared to control vehicle ($160 \pm 11\%$, n=7; $P < 0.05$). A β aggregated for 48 hrs did not affect LTP ($155 \pm 9\%$, n=5; $P > 0.05$) compared to control values. However, LTP was significantly impaired by A β that had been aggregated for 7 days ($136 \pm 4\%$, n=5; $P < 0.05$) compared to control values.

Electron microscopy and a congo red binding assay demonstrated that, A β aggregated for 7 days contained abundant amyloid fibrils, while freshly dissolved peptide contained no detectable fibrils and produced no CRB. None of these peptides produced an increase in IL-1 β in hippocampal tissue.

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