

**P049** Enhanced susceptibility of rat hippocampus to A $\beta$  with age  
Aedín M. Minogue, Caroline E. Herron\* and Marina A. Lynch  
*Trinity College Institute of Neuroscience, Department of  
Physiology, Trinity College, Dublin 2, Ireland.*  
*\*Conway Institute of Biomolecular and Biomedical Research,  
University College Dublin, Ireland.*

Long-term potentiation (LTP) is considered a possible neurophysiological model for learning and memory and is sensitive to stress, injury and insult. Evidence suggests that an age-related impairment of LTP exists and upregulation of proinflammatory cytokine-triggered signalling may underpin this effect. In the present study several markers of inflammation were examined and the data provide evidence for enhanced inflammatory signalling in the aged brain. Data presented here shows that acute administration of A $\beta$  induces an impairment in LTP in perforant path-granule cell synapses of 22-month old rats at concentrations that do not significantly affect LTP in 3-month old rats. The data are consistent with the idea that the increased susceptibility of aged rats is associated with underlying inflammatory changes. Significantly, supplementation with the n-3 polyunsaturated fatty acid, eicosapentaenoic acid (EPA), which has neuroprotective effects, abrogated the age-associated and A $\beta$ -induced inflammation. Consistent with these effects EPA restored LTP in hippocampus of aged rats and prevented the A $\beta$ -associated impairment of LTP. The evidence indicates that downregulation of age-related inflammatory changes preserves hippocampal function.