

Publication

Apolipoprotein E and cholesterol affect neuronal calcium signalling: the possible relationship to beta-amyloid neurotoxicity

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Besides the neurotoxic properties of beta-amyloid (beta A4), apolipoprotein E polymorphism seems to play an important role in the pathogenesis of sporadic Alzheimer's disease (AD). The calcium amplifying effect of beta A25-35 (the neurotoxic sequence of beta A4) in dissociated mouse brain neurons and human lymphocytes was nearly abolished by cholesterol (100-500 $\mu\text{mol/l}$). This effect may be related to the membrane stabilizing properties of cholesterol which could be confirmed by measurements of membrane fluidity. ApoE did not affect the Ca^{2+} amplifying effect of beta A25-35, but amplified the neuronal Ca^{2+} response significantly in a very low concentration (100nmol/l). The findings suggest a possible link between AD pathology and ApoE polymorphism by the calcium amplifying effect of ApoE itself as well as by the modulation of beta A4 neurotoxicity by cholesterol.

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