

Acetylcholinesterase, a senile plaque component, affects the fibrillogenesis of amyloid- β -peptides

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Abstract

Acetylcholinesterase (AChE) colocalizes with amyloid β peptide ($A\beta$) deposits present in the brain of Alzheimer's patients. Recent studies showed that $A\beta_{1-40}$ can adopt two different conformational states in solution (an amyloidogenic conformer, $A\beta_{ac}$, and a non-amyloidogenic conformer, $A\beta_{nac}$) which have distinct abilities to form amyloid fibrils. We report here that AChE binds $A\beta_{nac}$ and accelerates amyloid formation by the same peptide. No such effect was observed with $A\beta_{ac}$, the amyloidogenic conformer, suggesting that AChE acts as a 'pathological chaperone' inducing a conformational transition from $A\beta_{nac}$ into $A\beta_{ac}$ in vitro.