**“Novel inhibitors of amyloid aggregation in neurodegenerative diseases”**

**Summary:** Though it is widely accepted that amyloid-β (Aβ) is a key factor in Alzheimer's disease (AD) pathology, its underlying mechanism remains unclear. In order to study the association between Aβ and neural circuitry dysfunction, we developed a primary culture preparation derived from the nervous system of transgenic Drosophila melanogaster larvae expressing human Aβ1-42 (Aβ42). Cultured neurons undergo a consistent developmental process, culminating in an elaborate neuronal network with distinct functional and morphological characteristics. Throughout this development, a time-dependent increase in intracellular expression levels of Aβ42 was detected, followed by extracellular staining at a later time point. When compared to controls, Aβ42 cultures exhibited enhanced levels of apoptosis, resulting in reduced cell viability. Moreover, as primary culture preparations enable high resolution monitoring of neuronal phenotypes, we were able to detect subtle morphological changes in neurons expressing Aβ42, namely an enhancement in neurite outgrowth and arborization, which preceded the effect of neurodegeneration. Our results establish D. melanogaster primary neuronal cultures as a rapid, accessible and cost-effective platform for AD molecular studies and drug screening, and suggest a possible role for Aβ42 in the organization of neuronal processes.

**Recent publications.**


