Localization Studies and Role of Heparan Sulfate proteoglycan, Glypican-1 in Alzheimer's Disease.

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Proteoglycans, in particular heparan sulphate proteoglycans, have been implicated in several features of the pathogenesis of Alzheimer's disease (AD), including the genesis of senile plaques, cerebrovascular amyloid, and neurofibrillary tangles. Glypican-1, a GPI-anchored heparan sulfate proteoglycan binds to Aβ and accumulates in detergent-insoluble glycosphingolipid-enriched (DIG) domains where Aβ is also concentrated. Glypican-1 binds to Aβ through HS chains and may be involved in accumulation of Aβ in DIG domains and/or the formation of plaques at an initial stage. Glypican-1 may act as a negative factor to neuronal cell survival, probably by binding with Aβ. Individuals whose expression levels of glypican-1 are relatively high might have a higher risk of AD. It is important to define more precisely the exact role of glypican-1 in these pathological events. Knowledge about the role of proteoglycans in AD pathology may eventually be of therapeutic use, because small polysulphated compounds, which can interfere with the interaction between proteoglycan and Aβ have been shown to stop or even prevent amyloidogenesis.