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Binding of lipid-based nanoparticles to plasma Abeta: relevance for new therapeutic strategies in Alzheimer’s disease

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Depletion of Abeta represents the most efficacious perspective to prevent beta-amyloid toxicity and Alzheimer’s disease (AD) development. Nanoparticles (NPs) constitute an innovative vehicle potentially able to localize and interact with Abeta, in vitro and ex vivo. Studies performed in plasma from human subjects may represents an interesting opportunity to analyze the capability of NPs to bind the Abeta peptide present in periphery. However, it is noteworthy that Abeta and plasma proteins are in a state of dynamic equilibrium between bound and unbound forms depending on respective concentrations. So Abeta levels could be very high but only the free molecules can be measured by ELISA. For this reason a method to dissociate Abeta-plasma proteins complexes was set up to evaluate real Abeta content. Preliminary findings, performed in human plasma samples, confirmed an increase in detectable plasma Abeta 1-42 after dissociation procedure with respects to non dissociated samples. Following incubation with lipid-based NPs at different time and concentrations, a slight decrease in Abeta levels was shown. Further studies on a larger group of controls and AD patients may support the capacity of liposomes to sequester Abeta from plasma suggesting new therapeutic opportunities.

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