Nanoparticles for treatment of Alzheimer’s disease

Alzheimer’s Disease (AD) is a neurodegenerative disorder characterized by the β-amyloid (Aβ) peptide accumulation and deposition in the brain. Aβ alterations are thought to take place decades before the appearance of the first signs of dementia: This preclinical phase is considered the most promising period for successful disease-modifying therapies, which are still lacking. Since negatively charged lipids showed high binding affinity toward Aβ peptide and low-density lipoprotein-receptor was observed at the blood-brain barrier, we previously designed liposomes functionalized with phosphatidic acid and with a modified peptide derived from apolipoprotein-E (mApoE-PA-LIP) potentially able to enter the brain and disaggregate Aβ aggregates both in vitro and in vivo. We evaluated the possibility to use mApoE-PA-LIP for treatment of AD on different Tg rodent models of the disease, namely APP/PS1 or APP23 mice. The data obtained in vivo suggest that mApoE-PA-LIP is able either to promote the decrease of brain Aβ burden and the amelioration of memory impairment in “old” Tg mice upon acute treatment, or to slow down brain Aβ accumulation and memory impairment in “young” upon long term treatment. Together, these data indicate mApoE-PA-LIP as a new nanotechnological device potentially suitable for AD treatment.

Biography

Massimo Masserini is Full Professor of Biochemistry and Molecular Biology at the School of Medicine, University Milano-Bicocca, Milano, Italy. He is Head of the Nanomedicine Center NANOMIB of the same university. He has published more than 150 articles in journals of Biochemistry, Neuroscience and Nanomedicine. He is CEO of AmypoPharma, a Spin-off Company of the University Milano-Bicocca aiming to carry nanoparticles for treatment of Alzheimer disease to the clinical phase.

massimo.masserini@unimib.it