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Poster Sessions

Effects of nicotinic acetylcholine receptors on neurons, microglia, and bone marrow-derived microglia-like cells for the treatment of Alzheimer's disease.

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The accumulation of amyloid- β peptides ($A\beta$) is a critical trigger of Alzheimer's disease (AD) pathogenesis. $A\beta$ is derived from sequential proteolysis of amyloid precursor protein by β - and γ -secretases. Nicotinic acetylcholine receptors (nAChRs) are ligand-gated ion channels. Microglia and bone marrow-derived microglia-like (BMDML) cells have $A\beta$ phagocytic function, and nicotinic stimulation promotes microglial $A\beta$ phagocytosis. However, it is not yet known the nicotinic effects on BMDML cells and nAChR subtypes which involve in the promotion of microglial $A\beta$ phagocytosis. We here found that the stimulation of nAChRs promoted $A\beta$ phagocytosis in BMDML cells and $\alpha 7$ nAChR was involved in the promotion of microglial $A\beta$ phagocytosis. In a mouse model of AD, stimulation of $\alpha 7$ nAChR attenuated brain $A\beta$ burden and memory dysfunction. Moreover, $\alpha 7$ nAChR agonist suppressed γ -secretase activity. Results suggests that $\alpha 7$ nAChR subtype is a reasonable drug discovery target in AD, and the stimulation of nAChRs in BMDML cells may be a beneficial option for the development of the cell therapy in AD.