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Targeting of serotonin modulator and apolipoprotein E-conjugated liposomes to hippocampus for rescuing cholinergic neurons from apoptotic degeneration**Yung-Chih Kuo and Yin-Jung Lee**
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β -Amyloid (A β)-targeting liposomes (LIP) with surface serotonin modulator (SM) and apolipoprotein E (ApoE) were utilized to facilitate the delivery of nerve growth factor (NGF) across the blood–brain barrier (BBB) for neuroprotection in the hippocampus. The therapeutic efficacy of SM- and ApoE-grafted LIP carrying NGF (NGF-SM-ApoE-LIP) was assessed by an *in vitro* Alzheimer's disease (AD) model of degenerated SK-N-MC cells and an *in vivo* AD model of A β -insulted Wistar rats. The experimental evidences revealed that the modified SM and ApoE on the surface of LIP increased the permeation of NGF across the BBB without a serious damage to structural integrity of tight junction. When compared with free NGF, NGF-SM-ApoE-LIP up-regulated the expression of phosphorylated neurotrophic tyrosine kinase receptor type-1 on cholinergic neurons and significantly improved their survival. In addition, NGF-SM-ApoE-LIP could reduce the secretion of acetylcholinesterase and malondialdehyde and rescue hippocampal neurons from apoptosis in rat brains. The synergistic effect of SM and ApoE in NGF-SM-ApoE-LIP is efficacious in the induction of NGF to inhibit the neurotoxicity of A β and can be a potent anti-apoptotic pharmacotherapy for clinical care of patients with AD.

Biography

Yung-Chih Kuo is a Professor at the Department of Chemical Engineering, National Chung Cheng University. His research interests are focused on biomaterials, drug delivery system, nanomedicine, tissue engineering (cartilage and pancreas), blood-brain barrier, cancer therapy, nerve regeneration, spinal cord injury treatment, stroke treatment, Alzheimer's disease therapy, Parkinson's disease therapy, biophysics, colloid and interface science. He has authored or coauthored over 130 SCI journal papers, over 10 book chapters and patents. He is a Fellow of Royal Society of Chemistry (UK), an honor Member of Phi Tau Phi Society, a Life Member in various academic societies. He has won the Best Paper Award in 2016 and 2008, Prof. Tsai-Teh Lai Award in 2015, Special and Talented Scholar Award in 2013, Outstanding Research Award in 2013 and Young Scholar Award in 2003. He is also an Associate Editor of *J. Taiwan Inst. Chem. Eng.* and an Editorial Board Member in various journals and has been invited as an organizing committee member of many international conferences, Manuscript Reviewer for over 100 journals, an External Reviewer for academic awards, research grants, faculty recruitments and promotions and financial support of hosting international symposiums and an Advisory Board Committeeman of international conferences and symposiums.

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