

International Conference and Exhibition on

Marine Drugs and Natural Products

July 25-27, 2016 Melbourne, Australia

Cholinesterase inhibitory and protective effects of algal compounds against neurotoxicity and neuroinflammation

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Fucosterol, pheophytin A and pheophytin A isomer isolated from brown seaweeds such as *Padina ornata* and *Sargassum polycystum* as well as caulerpin isolated from the green seaweed, *Caulerpa racemosa* were assayed for their cholinesterase inhibitory activities and their neuroprotective effects on amyloid β_{1-42} ($A\beta_{1-42}$) / glutamate induced SH-SY5Y cells. Their anti-neuroinflammatory effects were also determined by measuring the levels of cytokines and pro-inflammatory mediators in lipopolysaccharide (LPS)-stimulated C8-B4 microglia cells. All four algal compounds exhibited inhibitory activities on acetylcholinesterase and butyrylcholinesterase in a dose dependent manner. They significantly increased the viability of $A\beta_{1-42}$ / glutamate induced SH-SY5Y cells but suppressed the expression of TNF- α , IL-1 β , IL-6, NO and PGE2 in LPS-stimulated C8-B4 cells. The four algal compounds showed dual cholinesterase inhibition and neuroprotective effects against $A\beta_{1-42}$ / glutamate / LPS suggesting possible applications for the prevention of Alzheimer's disease.

Biography

Gan Sook Yee has completed her PhD in Algal Biotechnology in 2005 from University Malaya, Malaysia. Currently, she is the Head of Life Sciences department under the School of Pharmacy at the International Medical University. Her main research interest is in the area of Algal Biotechnology (genetic engineering, algal transcriptomics and bioactives). She is also trained in Molecular Biology and has involved in gene expression studies and miRNA research in nasopharyngeal carcinoma. She is presently involved in the study of algal bioactives for neurodegenerative disorders.

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