

## Inflammatory Alleviation on Microglia Cells by an Apoptotic Mimicry

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**Abstract :** Microglia is a macrophage that resides in brain, and overactive microglia may result in brain neuron damage or inflammation. In this study, the phospholipids was extracted from squid skin and manufactured into a liposome (SQ liposome) to mimic apoptotic body. We then evaluated anti-inflammatory effects of SQ liposome on mouse microglial cell line (BV-2) by lipopolysaccharide (LPS) induction. First, the major phospholipid constituents in the squid skin extract were including 46.2% of phosphatidylcholine, 18.4% of phosphatidylethanolamine, 7.7% of phosphatidylserine, 3.5% of phosphatidylinositol, 4.9% of Lysophosphatidylcholine and 19.3% of other phospholipids by HPLC-UV analysis. The contents of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) in the squid skin extract were 11.8 and 28.7%, respectively. The microscopic images showed that microglia cells can engulf apoptotic cells or SQ-liposome. In cell based studies, there was no cytotoxicity to BV-2 as the concentration of SQ-liposome was less than 2.5 mg/mL. The LPS induced pro-inflammatory cytokines, including tumor necrosis factor-alpha (TNF- $\alpha$ ) and interleukin-6 (IL-6), were significant suppressed ( $P < 0.05$ ) by pretreated 0.03~2.5mg/ml SQ liposome. Oppositely, the anti-inflammatory cytokines transforming growth factor-beta (TGF- $\beta$ ) and interleukin-10 (IL-10) secretion were enhanced ( $P < 0.05$ ). The results suggested that SQ-liposome possess anti-inflammatory properties on BV-2 and may be a good strategy for against neuro-inflammatory disease.

**Keywords :** apoptotic mimicry, neuroinflammation, microglia, squid processing by-products

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