• 系統編號	RN9403-0171
• 計畫中文名稱	花生四烯酸促進神經生長因子所引發之腎上腺親鉻母細胞瘤細胞株神經分化及其分子機制之研究
• 計畫英文名稱	Arachidonic Acid Eenhances the Nerve Growth Factor- Induced Neuronal Differentiation in PC12 Cells: The Study of Molecular Mechanism
• 主管機關	行政院國家科學委員會 • 計畫編號 NSC91-2320-B038-044
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• 中文關鍵字	花生四烯酸; 神經生長因子; 腎上腺髓質親鉻母細胞瘤細胞; 神經軸突增生; 膽鹼乙醯轉移胺; 酪胺酸羥化胺
• 英文關鍵字	Arachidonic acid; Nerve growth factor (NGF); PC12 cell; Neurite outgrowth; Choline acetyltransferase; Tyrosine hydroxylase
• 中文摘要	花生四烯酸（AA）是多元不飽和脂肪酸的一種，會因各種外界的刺激或荷爾蒙的作用而由細胞膜中釋放出來，作爲二級訊息傳遞物質。在中樞神經系統中，雖然腦部缺血缺氧時所釋放出的高濃度 AA 會造成細胞死亡，許多證據也顯示 AA 在神經系統的發育上，扮演著很重要的角色。本研究中發現，低濃度的 AA（5 μM）能顯著地促進神經生長激素 NGF 所引發的神經分化。此外，利用免疫化學染色法，我們證實以神經生長因子處理 PC12 細胞，能怵萑乀祀 x 鹼乙醯轉移.和酪胺酸氫化.的表現； 而低濃度 AA 能近一步提高膽鹼乙醯轉移.的表現，但對於酪胺酸氫化.的表現則沒有顯著的影響。
• 英文摘要	Arachidonic acid (AA) is one of the polyunsaturated fatty acids, it can be released from the cell membrane phospholipid and serves as second messengers in response to extracellular stimuli or growth factors. In central nervous system, although high concentration of AA released during brain ischemia or hypoxia could induce cell death, evidences had also indicated the involvement of AA in the development of nerve system. In this study, we demonstrated that low concentration (5 M) of AA can enhance the nerve growth factor (NGF)-induced neurite outgrowth in PC12 cells. Besides, using immunocytochemistry, we demonstrated that both NGF treatment increase the expression of both choline acetyltransferase and tyrosine hydroxylase, and that low concentration of AA can further enhance the expression of choline acetyltransferase (ChAT), but not tyrosine hydroxylase. Therefore, NGF can induce PC12 cells to differentiate toward both dopaminergic and cholinergic neuron.