行政院國家科學委員會專題研究計畫　成果報告

三亞麻油酸對應力所誘發血管內皮細胞內皮素基因表現的作用

計畫類別：個別型計畫
計畫編號：NSC92-2314-B-038-056-
執行期間：92 年 08 月 01 日至 93 年 07 月 31 日
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計畫主持人：陳保羅

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行政院國家科學委員會補助專題研究計畫 **V** **□成果報告**

□期中進度報告

（計畫名稱）

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共同主持人：王寧

計畫參與人員：鄭志鴻

成果報告類型(依經費核定清單規定繳交)：V精簡報告　□完整報告

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執行單位：台北醫學大學醫學系內科學科

中　華　民　國　9 3　年　9　月　9　日

中文摘要

三亞麻油酸（Trilinolein, Tril）為一天然三酸甘油脂，主要是分離自傳統中草藥三七（又名田七或川七）的根部。過去的實驗顯示具有心肌保護作用。但它的細胞分子作用機轉仍未清楚。

本實驗使用血管內皮細胞，在應力拉扯下會產生氧自由基（ROS）再加上內皮素第一型（Endothelin-1, ET-1）的作用，ET-1 也會刺激 ROS 的產生及心肌細胞肥厚。經由此實驗模式，來觀察 Tril 的作用。實驗結果顯示 Tril 可減少 ROS 的產生。利用對照組的抗氧化物 N-acetyl-cysteine（NAC）也有同樣效果。兩種物質 Tril 及 NAC 都可減少因 ROS 或 ET-1 刺激而激活的 Activator protein-1（AP-1）reporter gene 的活化，已知 AP-1 是導致心肌細胞肥厚的訊息傳遞因子之一。故 Tril 的分子保護機轉可能經由抑制 AP-1 的作用。

INHIBITION OF CYCLIC STRAIN-INDUCED ENDOTHELIN-1 SECRETION BY TRILINOLEIN

ABSTRACT

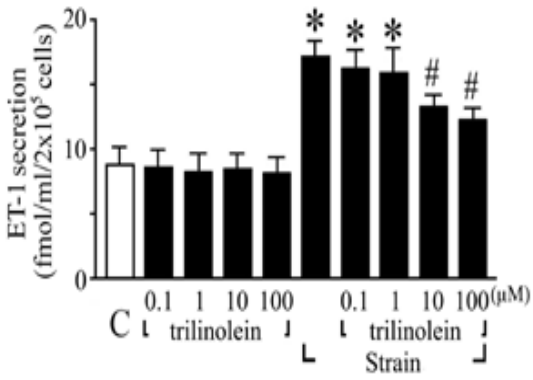
Ttrilinolein, isolated from the traditional Chinese herb *Sanchi* (*Panax notoginseng*), has been shown to have myocardial protective effects via its antioxidant ability. However, the cellular and molecular mechanisms of the protective effect of trilinolein in the vascular system remain to be elucidated. Endothelin-1 (ET-1) is a potent vasopressor synthesized by endothelial cells both in culture and in vivo. The aims of this study were to test the hypothesis that trilinolein may alter strain-induced ET-1 secretion and to identify the putative underlying signaling pathways in endothelial cells. We show that trilinolein inhibits strain-induced ET-1 secretion. Trilinolein also inhibits strain-increased reactive oxygen species (ROS) formation. Furthermore, pretreating cells with trilinolein or antioxidant N-acetyl-cysteine decrease strain-increased ET-1 secretion. Both trilinolein and N-acetyl-cysteine also attenuated the strain-stimulated activator protein-1 reporter activity. In summary, we demonstrate that trilinolein inhibits strain-induced ET-1 secretion, partially via attenuation of ROS formation.

SPECIFIC AIMS

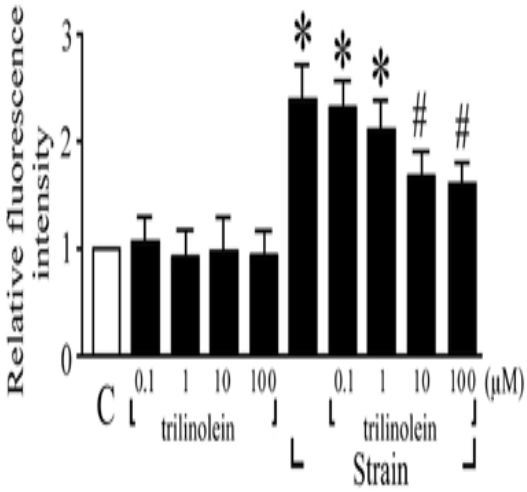
The aims of this study were to test the hypothesis that trilinolein may alter strain-induced ET-1 secretion and to identify the putative underlying signaling pathways in endothelial cells.

RESULTS

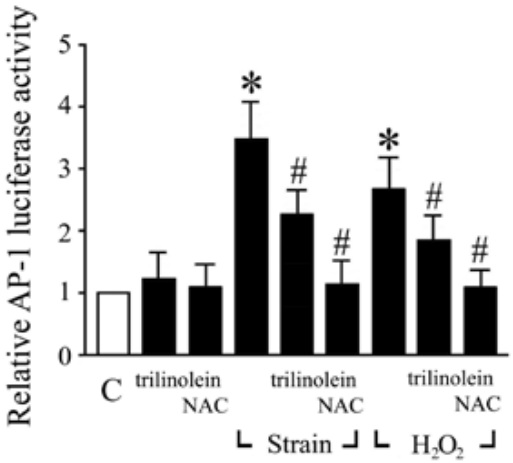
Trilinolein inhibits strain-induced ET-1 gene expression in endothelial cells.



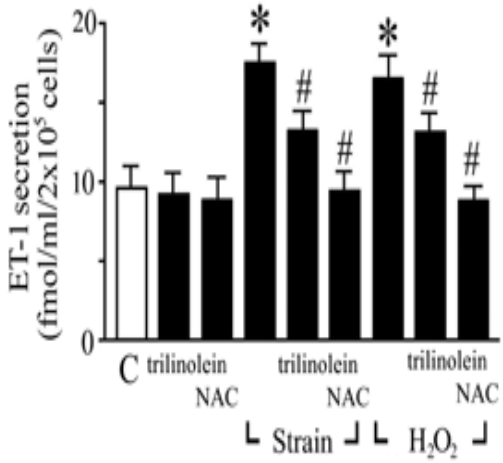
Effect of trilinolein on strain-induced ROS generation in endothelial cells.



Inhibitory effect of trilinolein on strain-increased activator protein-1 reporter activity in endothelial cells.



Trilinolein *via* attenuation of ROS generation in endothelial cells.



CONCLUSIONS

In summary, we demonstrate that trilinolein inhibits strain-induced ET-1 secretion, partially via attenuation of ROS formation.

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本研究所獲得的資料皆有創新性，完整報告未來應可發表在 SCI 雜誌。