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• 計畫中文名稱	中草藥三七抽取物三亞麻油酸對糖尿病鼠的心肌細胞的 PPAR 受體的調節作用
• 計畫英文名稱	The Modulating Effect of Trilinolein, a Natural Triglyceride Isolated from the Herb Sanchi, to the PPAR Receptors of Streptozotocin-Induced Diabetic Rat Heart
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• 中文關鍵字	糖尿病；PPAR 受體；氧自由基；三亞麻油酸
• 英文關鍵字	Diabetes; PPAR receptors; Reactive oxygen species; Trilinolein
• 中文摘要	Peroxisome proliferators-activated receptors (PPARs)是一群由配體(ligand)所調控的轉錄因子家族，參予調控細胞的脂質代謝，包括： 脂質代謝作用(lipid metabolism) 以及發炎反應(inflammation)。目前 PPARs 分成 PPARα, PPARγ 及 PPARδ(或稱作 PPARβ)三種亞型，其中，PPARδ 爲心肌細胞中主要的表現型。文獻指出，將小鼠心肌的 PPARδ 剔除，會觀察到小鼠呈現心肌肥大的現象。此外，活化 PPARδ 也有助於抑制心肌增生的作用；顯示 PPARδ 對於心肌細胞的增生是一個很重要的角色。高血糖是目前公認造成糖尿病併發心血管疾病的最主要原因，而心肌增生也是心血管疾病的一個徵兆。首先，二十週齡糖尿病的大鼠確實有心肌肥大的現象。此外，心跳速率與血壓與對照組相比較也有明顯偏低的現象。因此，高血糖可能會影響 PPARδ 的基因表現，進而破壞細胞的正常生理功能。故使用 H9c2 細胞株(大鼠心肌細胞)，探討高濃度葡萄糖對心肌細胞中 PPARδ 的影響，藉此了解糖尿病引致心血管疾病的分子機轉。結果發現，在高濃度葡萄糖的長時間刺激之下，PPARδ 表現明顯的被抑制，呈現具有劑量與時間相關性的變化。文獻指出，糖尿病病人體內大量氧化自由基(Reactive oxygen species, ROS)的產生是造成心血疾病發生的原因。爲了確認氧化自由基是否是造成 PPAR 基因表現的衰退，所以使用了 ROS 生成抑制劑三亞麻油酸（Trilinolein）。此 Trilinolein 來自中草藥三七的根部所純化，且有心肌保護作用。結果發現，經 ROS 生成抑制劑 Trilinolein 處理後，能夠預防因高糖所產生大量的氧化自由基所抑制心肌細胞 PPARδ 的表現有被阻斷的現象；顯示 ROS 可能是造成 PPARδ 衰退的原因。因此，未來將繼續探討就由高濃度葡萄糖所產生的 ROS 是如何影響心肌細胞 PPAR δ 的表現，期能解明糖尿病易併發心血管疾病的機轉，也可闡明中草藥治療心血管病的科學基礎，實驗結果顯示 Trilinolein 無法改

	變糖尿病鼠的 PPAR receptor 的作用。
• 英文摘要	Peroxisome proliferatior-activated receptors (PPARs) are ligand-activated transcription factor that regulate the expression of gene involved lipid metabolism and inflammation. The PPAR subfamily consisted three subtypes, PPARalpha, PPARgamma and PPARdelta(also called PPARbeta). It has been demonstrated PPARdeltais the predominant subtype in cardiomyocytes. Previous studies indicated the cardiac PPARdelta deletion caused the mice with cardiac hypertrophy and PPARdeltaactivation can inhibit the cardiac hypertrophy. It means that PPARdeltais an important factor in the proliferation of cardiomyocytes. As we known, hyperglycemia is the major risk factor for coronary heart disease in patients with diabetes and the left ventricular hypertrophy is the major complication of hypertensive heart disease, especially in patients with diabetes For investigating the effect of hyperglycemia on the expression of PPARdelta. First, we confirmed the 20 weeks old of streptozotocin-induced diabetic rats; we found the heart ratio (heart weight／total weight) of diabetic group was increased. Both heart rate and blood pressure compared with control group were decreased. Furthermore, the gene expression of PPARdeltawas deceased. Thus, we thought the hyperglycemia damaged the physiological function of myocytes through regulating of PPARdelta. Then, we used H9c2 cell (mice cardiomyocytes) for investigating the expression of the PPARdelta in the high glucose level culture medium. We found that the PPARdelta expression was decreased in time and showed a dose-related manner by high glucose treatment. It has been reported that large amount of reactive oxygen species (ROS), increased oxidative stress, was produced and damaged the cardiovascular system in patient with diabetes. To characterize the ROS production by glucose, we used the natural inhibitor (the natural antioxidant Trilinolein isolated form the herb Sanchi) of ROS generation before glucose treatment. Then, the decrease of PPARdeltawas blocked by that treatment. In the future, we will try to elucidate the link between the glucose-induced ROS and PPARdelta expression, and try to elucidate the scientific basis of traditional Chinese medicine in the treatment of cardiovascular disease. Results indicated that trilinolein could not modulate the effect of PPAR receptors in diabetic rats.