行政院國家科學委員會專題研究計畫　成果報告

與胰島素抗阻症相關之 Adiponectin 基因之調控

計畫類別：個別型計畫
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中文摘要:
關鍵詞: adiponectin， 基因重組蛋白質，轉錄，啟動子，訊息 RNA

我們的實驗室近來都注重於 adiponectin 之臨床、遺傳學及分子學研究。過去一年中，我們發表了四篇論文。我們也成功的備製了它的基因重組蛋白質。我們也選殖了人類及鼠類之啟動子，以為後續研究該基因轉錄調控之用。我們已經利用北方點墨法及半定量 PCR，顯示 adiponectin 在 3T3-L1 受到 IL-6 及 IL-10 之調控。

英文摘要:
key words: adiponectin, recombinant protein, transcription, promoter, mRNA

Our lab has been working on the clinical, genetic and molecular biology of adiponectin gene. In the last one year (2003-08-01 to present), we have published four papers on adiponectin. We have also introduced plasmid expression full-length human adiponectin gene into HEK293T cells and established a stable cell line. We have purified the recombinant adiponectin from the medium. We also have cloned the human and mouse adiponectin promoters for transcription regulation study. Using Northern blot or semi-quantitative PCR, we also showed that adiponectin can be regulated by IL-6 and IL-10 in 3T3-L1 cells.

報告內容 :

前言及目的:

Adiponectin is a adipose tissue-derived plasma protein. The plasma levels of this protein have been demonstrated to be important in the pathophysiology of the metabolic syndrome. The experiments using knockout mice and recombinant adiponectin protein by others has demonstrated the same effects of this protein. Interestingly, the expression of this protein is down-regulated in the conditions of insulin resistance. Therefore, we postulated that the deciphering the molecular mechanisms that regulate the expression of adiponectin will help explain the molecular mechanisms of insulin resistance.

方法與結果:

We conducted some clinical, genetic and molecular studies. In the last one year, we have published 4 papers (Huang et al. 2003; Yang et al. 2003; Huang et al. 2004; Huang et al. 2004). Currently, we are submitting one manuscript and are writing up

the other manuscript of adiponectin. We also have introduced the full-length human adiponectin cDNA into the HEK293T cells, established the stable clones and were able to purify the recombinant proteins from the culture medium (Fig 1). We also have cloned the human and mouse adiponectin promoters (Fig 2) for future transcription regulation study. Using Northern blot and quantitative PCR, we have also demonstrated that adiponectin is regulated by IL-6 (Fig 3) and IL-10 (data not shown). We are working on the molecular mechanisms of these results.

參考文獻:

Huang KC, Chen CL, Chuang LM, Ho SR, Tai TY, Yang WS (2003) Plasma adiponectin levels and blood pressures in nondiabetic adolescent females. J Clin Endocrinol Metab 88:4130-4134.

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Yang WS, Chen MH, Lee WJ, Lee KC, Chao CL, Huang KC, Chen CL, Tai TY, Chuang LM (2003) Adiponectin mRNA levels in the abdominal adipose depots of nondiabetic women. Int J Obes Relat Metab Disord 27:896-900.

成果自評:

The results of adiponectin research are very fruitful. However, we need to work harder on the molecular mechanisms of adiponectin signaling and regulation.

圖表:

Fig 1 A Western blot of the culture medium of HEK293 cells stably transfected with adiponectin-expressing plasmid using adiponectin-specific antibody (both lanes).

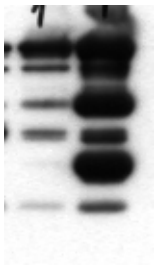

Fig2 The deletion constructs of the mouse adiponectin promoters driven the expression of the luciferase reporter gene.

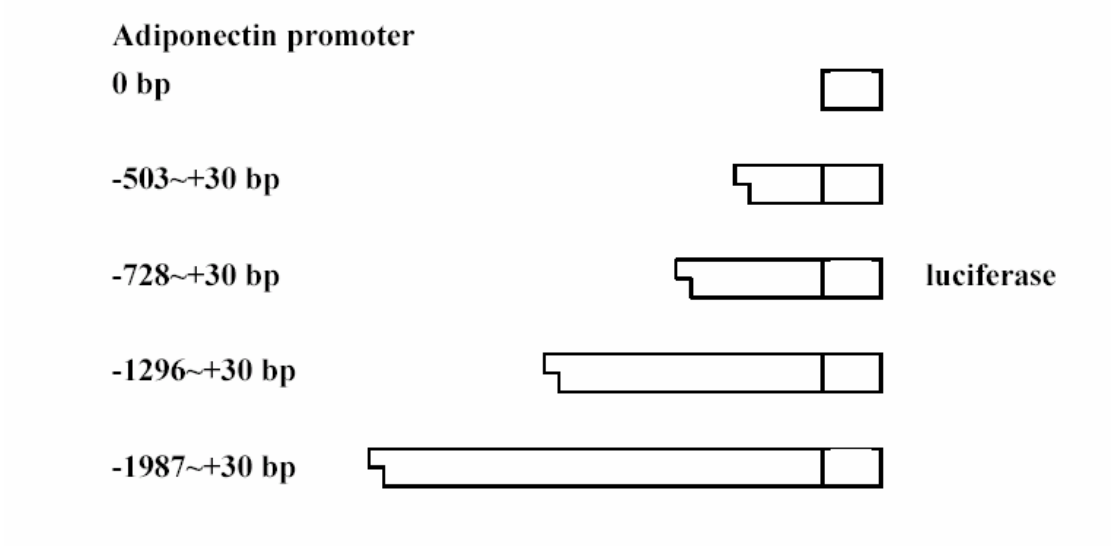

Fig 3 IL-6 decreased the adiponectin steady-state mRNA level in differentiated 3T3-L1 adipocytes shown by semi-quantitative PCR.