

中草藥對腫瘤壞死因子- $\alpha$ 所誘發之基質金屬活化蛋白酶  
-1 及-9 之活性及介白素-8 分泌之影響

**The effect of Chinese herbal medicines on  
TNF- $\alpha$  induced matrix metalloproteinase-1;-9  
activities and interleukin-8 secretion**

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摘要

基質金屬活化蛋白酶(matrix metalloproteinases, MMPs)在正常生理功能及病理狀態下扮演非常重要之角色。它們與正常皮膚功能以及老化、傷口癒合、胚胎發育、生殖和皮膚之發炎反應都有關係。先前的研究報告指出，在皮膚炎病人之皮膚上，發現高量的基質金屬活化蛋白酶-1 和-2 之活性；在未癒合的傷口上，聚積著大量的基質金屬活化蛋白酶-9。介白素-8(Interleukin-8, IL-8)，屬於 C-X-C 趨化素，它可以調節嗜中性球之召集與活化，而且參與各種發炎反應之皮膚疾病中。在此研究中，我們利用人類纖維母細胞株 WS-1，分析 11 種具潛力之抗發炎反應之中草藥。結果顯示，當我們以腫瘤壞死因子- $\alpha$  (TNF- $\alpha$ )刺激 WS-1 細胞時，基質金屬活化蛋白酶-1 和-9 (而非基質金屬活化蛋白酶-2) 會被誘導增加。但當我們在 WS-1 細胞中這 11 種中草藥做前處理，再以腫瘤壞死因子- $\alpha$  刺激，所有的中草藥皆可抑制 WS-1 細胞中由腫瘤壞死因子- $\alpha$  所誘導之基質金屬活化蛋白酶-1 之活性。此外，若先以牡丹皮(Paeonia suffruticosa)，黃芩(Scutellaria baicalensis)，防風(Saposhnikovia divaricata)，山藥(Dioscorea opposita)，覆盆子(Rubus chingii)，或丹參(Salvia miltiorrhiza)前處理 WS-1 細胞，則皆可抑制基質金屬活化蛋白酶-9 之活性。當中，以覆盆子(Rubus chingii)前處理 WS-1 細胞，可以顯著的抑制腫瘤壞死因子- $\alpha$  所誘導之介白素-8 之分泌。這些結果顯示，在這此 11 種中草藥中，可能存在著一些有效成分，可以用來治療皮膚細胞之發炎反應。

**Abstract**

Matrix metalloproteinases (MMPs) play an important role in normal physiological functions and pathological processes. They are involved in normal skin functions as well as

in the aging, healing, embryonic development, reproduction, and inflammatory responses of skin. Previous studies report that both high MMP-1 and MMP-2 activities were found in the skin of patients with dermatitis, and large amounts of MMP-9 have been reported to be accumulated in unhealed wounds. Interleukin-8 (IL-8), a C-X-C chemokine, may mediate neutrophil recruitment and activation and is involved in various inflammatory skin diseases. In this study, eleven Chinese herbal medicines were analyzed for their potential as anti-inflammatory agents using human fibroblast WS-1 cell lines. The results indicate MMP-1 and -9, but not MMP-2, were induced by TNF- $\alpha$  treatment in WS-1 cells. However, when WS-1 cells were pre-treated with eleven Chinese herbal medicines before TNF- $\alpha$  stimulation, all these herbal medicines suppressed TNF- $\alpha$ -stimulated MMP-1 activity in WS-1 cells as analyzed by casein zymography. In addition, the suppression of MMP-9 activity was also observed when WS-1 cells were treated with either *Paeonia suffruticosa*, *Scutellaria baicalensis*, *Saposhnikovia divaricata*, *Dioscorea opposita*, *Rubus chingii*, or *Salvia miltiorrhiza*. Of which, *R. chingii* significantly inhibited IL-8 secretion induced by TNF- $\alpha$  treatment as well. These results revealed that some novel components present in these Chinese herbal medicines may be used for the treatment of inflammatory responses in skin cells.