

신세포암에서 시안산에 의한 MMP-9 생성의 감소효과

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Cyanate Decreases Matrix Metalloproteinase-9 Productions via Increasing Tissue Inhibitors of Metalloproteinase-1 Expressions in Renal Cell Carcinoma

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Objective : A very recent report unveiled an alternative and quantitatively dominant mechanism for cyanate formation and protein carbamylation. Cyanate is a reactive species in equilibrium with urea and reacts with nucleophilic groups on proteins through carbamylation of lysine residues to form ϵ -carbamylylsine (homocitrullin), altering protein structure and function. Matrix metalloproteinases (MMPs) are the most well known extracellular matrix (ECM)-degrading zinc-dependent enzymes. Numerous studies have demonstrated association between expression and production of MMPs and the TIMPs and metastasis, and angiogenesis. We hypothesized that cyanate may function to regulate MMP-9 in renal diseases.

Methods and Results : Human renal carcinoma cell line (Caki-1) was used to investigate the regulation of MMP-9 expression by cyanate. Carcinoma cells treated with cyanate (0.01, 0.1, and 1.0 mM) for 24 h showed reduced MMP-9 activity but not MMP-2 activity by zymography analysis. Decreased MMP-9, but not MMP-2, mRNA expressions by cyanate were also observed. Consistent with decreased expression levels and activities of MMP-9 by cyanate, we found, by ELISA analysis, that cyanate inhibited the productions of MMP-9 in renal carcinoma cells. To determine the possible involvement of TIMP in cyanate inhibited MMP-9 production, expression level of TIMP-1 was investigated and we found that cyanate increased TIMP-1 significantly.

Conclusion : In summary, we demonstrated that cyanate attenuated MMP-9 activity by increasing TIMP-1 expression in renal carcinoma cells and further studies as to the functions of cyanate will be needed.

Key Words : 시안산, MMP-9, 신세포암

Cyanate, MMP-9, Renal cell carcinoma