

題名:Chondroprotective effects of glucosamine involving the p38
MAPK and Akt signaling pathways.

作者:梁有志; 陳建和

Lin YC; Liang YC; Sheu MT; Lin YC; Hsieh MS; Chen TF;
Chen CH.

貢獻者:醫學檢驗暨生物技術學系

上傳時間:2009-08-25T02:38:01Z

摘要:Abstract The purpose of the present study was to elucidate the possible signal transduction pathway involved in the underlying mechanism of glucosamine (GLN)' s influence on the gene expression of matrix metalloproteinases (MMPs) in chondrocytes stimulated with IL-1 . Using chondrosarcoma cells stimulated with IL-1 , the effects of GLN on the mRNA and protein levels of MMP-3, the activation of JNK, ERK, p38, NF- B, and AP-1, the nuclear translocation of NF- B/Rel family members, and PI3-kinase/Akt activation were studied. GLN inhibited the expression and the synthesis of MMP-3 induced by IL-1 , and that inhibition was mediated at the level of transcription involving both the NF- B and AP-1 transcription factors. Translocation of NF- B was reduced by GLN as a result of the inhibition of I B degradation. A slightly synergistic effect on the activation of AP-1 induced by IL-1 was shown in the presence of GLN. Among MAPK pathways involved in the transcriptional regulation of AP-1, phosphorylation of JNK and ERK was found to increase with the presence of GLN under IL-1 treatment, while that for p38 decreased. It was also found that GLN alone, but

also

synergistically with IL-1 , was able to activate the Akt pathway. The requirements of NF- B translocation and p38 activity are indispensably involved in the induction of MMP-3 expression in chondrosarcoma cells stimulated by IL-1 . Inhibition of the p38 pathway in the presence of GLN substantially explains the chondroprotective effect of

GLN on chondrocytes that regulate COX-2 expression, PGE2 synthesis, and NO expression and synthesis. The chondroprotective effect of GLN through the decrease in MMP-3 production and stimulation of proteoglycan synthesis

may follow another potential signaling pathway of Akt.