Luteolin suppresses IL-1beta-induced cytokines and MMPs production via p38 MAPK, JNK, NF-kappaB and AP-1 activation in human synovial sarcoma cell line, SW982.

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Abstract
Matrix metalloproteinases (MMPs) play an important role in tissue degradation in rheumatoid synovium and inflammatory cytokines are essential in the pathogenesis of rheumatoid arthritis (RA). This study was conducted to evaluate the efficacy of luteolin in regulating interleukin-1beta (IL-1beta)-induced production of MMPs (MMP-1 and -3) and cytokines (tumor necrosis factor (TNF)-alpha and IL-6) in human synovial cell line, SW982. Treatment with luteolin at 1 or 10 microM significantly (P<0.05) inhibited IL-1beta-induced MMPs (MMP-1 and -3) and cytokines (TNF-alpha and IL-6) production when measured by enzyme-linked immunosorbent assay (ELISA). The mitogen-activated protein kinases (MAPKs) represent an attractive target for RA because they can regulate MMP and cytokine expression. The effects of luteolin on the activation of MAPKs and transcription factors were also examined in SW982 cells by ELISA. IL-1beta-induced JNK and p38 activation were inhibited by luteolin. Moreover, IL-1beta-induced activator protein-1 (AP-1) and nuclear factor-kappaB (NF-kappaB) activation were inhibited by luteolin. These results suggest that luteolin reduces the production of MMPs and cytokines in SW982 cells by inhibiting MAPKs (JNK and p38) and transcription factors (AP-1 and NF-kappaB).

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