Dokumente

Suchschritt : FT=p38 AND FT=diathermy

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Titel: Short waves-induced enhancement of proliferation of human chondrocytes: involvement of extracellular signal-regulated map-kinase (erk).

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Schlagwörter

CT: CELL PROLIFERATION/*radiation effects; CELL SURVIVAL/radiation effects; CELLS, CULTURED; CHONDROCYTES/enzymology; CHONDROCYTES/*radiation effects; EXTRACELLULAR SIGNAL-REGULATED MAP KINASES/antagonists & inhibitors; EXTRACELLULAR SIGNAL-REGULATED MAP KINASES/*metabolism; FLAVONOIDS/pharmacology; HUMANS; MAP KINASE SIGNALING SYSTEM/*radiation effects; MITOGEN-ACTIVATED PROTEIN KINASE 1/metabolism; MITOGEN-ACTIVATED PROTEIN KINASE 3/metabolism; PHOSPHORYLATION; PROTEIN KINASE INHIBITORS/pharmacology; RADIO WAVES/*; TIME FACTORS

CTG: ZELLPROLIFERATION/*Strahlenwirkungen; ZELLEBENSDAUER/Strahlenwirkungen; ZELLEN, KULTIVIERTE;

CHONDROZYTEN/Enzymologie; CHONDROZYTEN/*Strahlenwirkungen; EXTRAZELLULÄRE SIGNALREGULIERTE MAP-KINASEN/Antagonisten & Inhibitoren; EXTRAZELLULÄRE SIGNALREGULIERTE MAP-KINASEN/*Stoffwechsel; FLAVONOIDE/Pharmakologie; MENSCH; MAP-KINASE-SIGNALSYSTEM/*Strahlenwirkungen; P42-MAP-KINASE/Stoffwechsel; MITOGEN-AKTIVIERTE PROTEINKINASE 3/Stoffwechsel; PHOSPHORYLIERUNG; PROTEINKINASE-INHIBITOREN/Pharmakologie; RUNDFUNKWELLEN/*; ZEITFAKTOREN

TE: Flavonoids; PD 98059; Protein Kinase Inhibitors; Extracellular Signal-Regulated MAP Kinases/E.C. 2.7.1.37; Mitogen-Activated Protein Kinase 1/E.C. 2.7.1.37; Mitogen-Activated Protein Kinase 3/E.C. 2.7.1.37

CR: E.C. 2.7.1.37; E.C. 2.7.1.37; E.C. 2.7.1.37

AB: 1. Short-wave **diathermy** (SWD) is a form of radiofrequency radiation that is used therapeutically by physiotherapists. The cellular mechanisms of SWD are unclear. The present study was performed to explore the effect of different conditions of short-wave exposure on the proliferation of cultured human chondrocytes. 2. Cells exposed to short waves once per day for seven consecutive days exhibited a significant increase in proliferation by 42% compared with the control cells. In cells that were treated with short waves twice per day for seven consecutive days, or only once on Day 1 and then examined for proliferation on Day 7, cell proliferation was greater than the control cells by 40% and 30%, respectively. 3. Given the importance of mitogen-activated protein kinases (MAPK) in the proliferation of different cell types, efforts were extended to explore the role of three major types of MAPK; that is, extracellular signal-regulated kinase (ERK), c-Jun NH(2)-terminal protein kinase (JNK) and **p38**. 4. It was found that the level of phosphorylated ERK (phospho-ERK 1 and ERK 2) increased significantly within 5-120 min following consecutive exposure to short waves for 7 days. Exposure to short waves failed to alter the intensity of phosphorylated JNK and **p38** within 0-240 min. 5. Cells were exposed to short waves once for seven consecutive days in the presence of 0, 10 micromol/L, 20 micromol/L or 50 micromol/L PD98059 (an ERK inhibitor). PD98059 totally inhibited short waves-induced enhancement of proliferation without altering normal control viability. In the presence of short waves and PD98059, the cell viability was lower than the normal control. Together, the data suggest that short waves could increase proliferation in human chondrocytes through activation of the ERK pathway, which is also involved in maintaining normal cell proliferation under physiological conditions.

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