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1: Eur J Clin Chem Clin Biochem 1994
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Influence of electromagnetic fields on the enzyme activity of rheumatoid synovial fluid/cells in vitro.

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Since positive clinical effects have been observed in the treatment of rheumatoid arthritis with electromagnetic fields of weak strength and low frequency range (magnetic field strength: 70 microT; frequency: 1.36-14.44 Hz), an attempt was made to analyse the effects of these electromagnetic fields on enzyme activity in monolayer cultures of rheumatoid synovial fluid cells after single irradiation of the cultures for 24 hours. We only investigated the matrix metalloproteinases (collagenase, gelatinase, proteinase 24.11 and aminopeptidases). It was found that electromagnetic fields of such a weak strength and low frequency range do not generally have a uniform effect on the activity of the different proteinases in vitro. While aminopeptidases do not show any great changes in activity, the peptidases hydrolysing N(2,4)-dinitrophenyl-peptide exhibit a distinct increase in activity in the late phase in culture medium without fetal calf serum. In the presence of fetal calf serum this effect is not observed and enzyme activity is diminished. Our experiments do not show whether such a phase-bound increase in the activity of proteinases in vitro is only one finding in a much broader range of effects of electromagnetic fields, or whether it is a specific effect of weak pulsed magnetic fields of 285 +/- 33 nT on enzyme activity after single irradiation. This question requires further elucidation.

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