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[Review](#) [Am J Transl Res.](#) 2018 May 15;10(5):1260-1272. eCollection 2018.

# Coupling of pulsed electromagnetic fields (PEMF) therapy to molecular grounds of the cell

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## Abstract

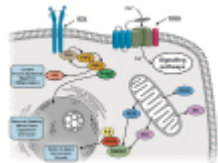
In this review we compile results cited in reliable journals that show a ratio for the use of pulsed electromagnetic fields (PEMF) in therapy, indeed. This is true especially for chronically inflamed joints. Furthermore, we try to link this therapeutic approach to the molecular background of chronic inflammation and arthritis. At first we start with the clinical outcome of PEMF therapy. Then, we look for possible triggers and an electromagnetic counterpart that is endogenously inherent in cell biology and in the tissues of interest. Finally, we want to investigate causal molecular and cellular mechanisms of possible PEMF actions. It shows that there are endogenous mechanisms, indeed, which can act as triggers for PEMF like the resting membrane potential as well as resonance mechanisms in charged moieties like membrane transporters. Especially voltage-gated calcium channels can be triggered.

These may lead into specific signaling pathways and also may elicit nitric oxide as well as moderate radical reactions, which can ultimately lead to e.g. NF $\kappa$ B-like reactions. Concerted in the right way, these reactions can cause a kind of cell protection and ultimately lead to a dampening of inflammatory signals like interleukins.

**Keywords:** PEMF; arthritis; cell biology; endogenous electric; molecular mechanisms.

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## Figures



**Figure 1** Different ways of PEMF-coupling to...

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