S18.3 PULSED ELECTROMAGNETIC FIELD MODULATES THE INFLAMMATORY ENVIRONMENT INDUCED BY INTERLEUKIN-1β ON HUMAN TENDON-DERIVED CELLS

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Unresolved inflammatory processes in tendon healing have been related to the progression of tendinopathies. Thus, the management of tendon injuries may rely on cell-based strategies to identify and modulate tendon inflammatory cues. Pulsed electromagnetic field (PEMF) has been approved by FDA for orthopedics therapies and has been related to a reduction in pain and to improve healing. However, the influence of PEMF in tendon healing remains largely unknown. Human tendon resident cells (hTDCs) were cultured in an inflammatory environment induced by exogenous supplementation of IL-1β and their response assessed after exposure to different PEMF treatments. This study demonstrates that IL-1β induced up-regulation of pro-inflammatory factors (IL-6 and TNFα) and extracellular matrix components (*MMP-1, -2, -3*) whereas reduces the expression of *TIMP-1*, *suggesting* IL-1β as a candidate inflammation model to study hTDCs response to inflammation cues. Moreover, in both homeostatic and inflammatory environments, hTDCs respond differently to PEMF treatment suggesting that cells are sensitive to magnetic field parameters such as strength (1.5 – 5mT), frequency (5-17Hz) and duration (10-50% duty cycle, dc). Among the conditions studied, PEMF treatment with 4mT/5Hz/50%dc suppresses the inflammatory response of hTDCs to the IL-1β stimulation, as evidenced by the decreases amount of IL-6, TNFα and downregulation of *MMP-1, -2, -3* and *COX-2, IL-8, IL-6, TNFα*

genes. These results demonstrate the potential of PEMF, in particular 4mT/5Hz/50%dc PEMF in treating tendon inflammation suppressing the inflammatory stimulation induced by IL-1β, which may be beneficial for tendon healing strategies.