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RESEARCH ABSTRACT FORM

TITLE: VAC Therapy and Mechanisms of Wound Healing

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Wound healing consists of the inflammatory, proliferative and remodeling phases, which if interrupted, due to factors such as diabetes, arterial disease, old age or infection, may result in the development of chronic non-healing wounds. Vacuum Assisted Closure (VAC) is one of the few treatments for chronic wounds, however, it is not always effective and the mechanisms for its effectiveness are not fully understood. It was our hypothesis that mechanical strain exerted on cells during VAC therapy is anti-inflammatory, regenerative and up-regulates wound healing. To test this hypothesis human dermal fibroblasts were exposed to dynamic tensile forces (DTF) in the presence of Interleukin (IL-1) and Tumor Necrosis Factors (TNF). Following exposure to DTF, the mRNA expression for pro-inflammatory proteins (iNOS, COX2, MMP-1, MMP-13) and growth factors (KGF, VEGF, FGF1, FGF2) were tested by RT/PCR. We show that DTF of 1.5% and 3% magnitudes suppresses inflammation induced by Interleukin-1beta and Tumor Necrosis Factor, while inducing growth factors.